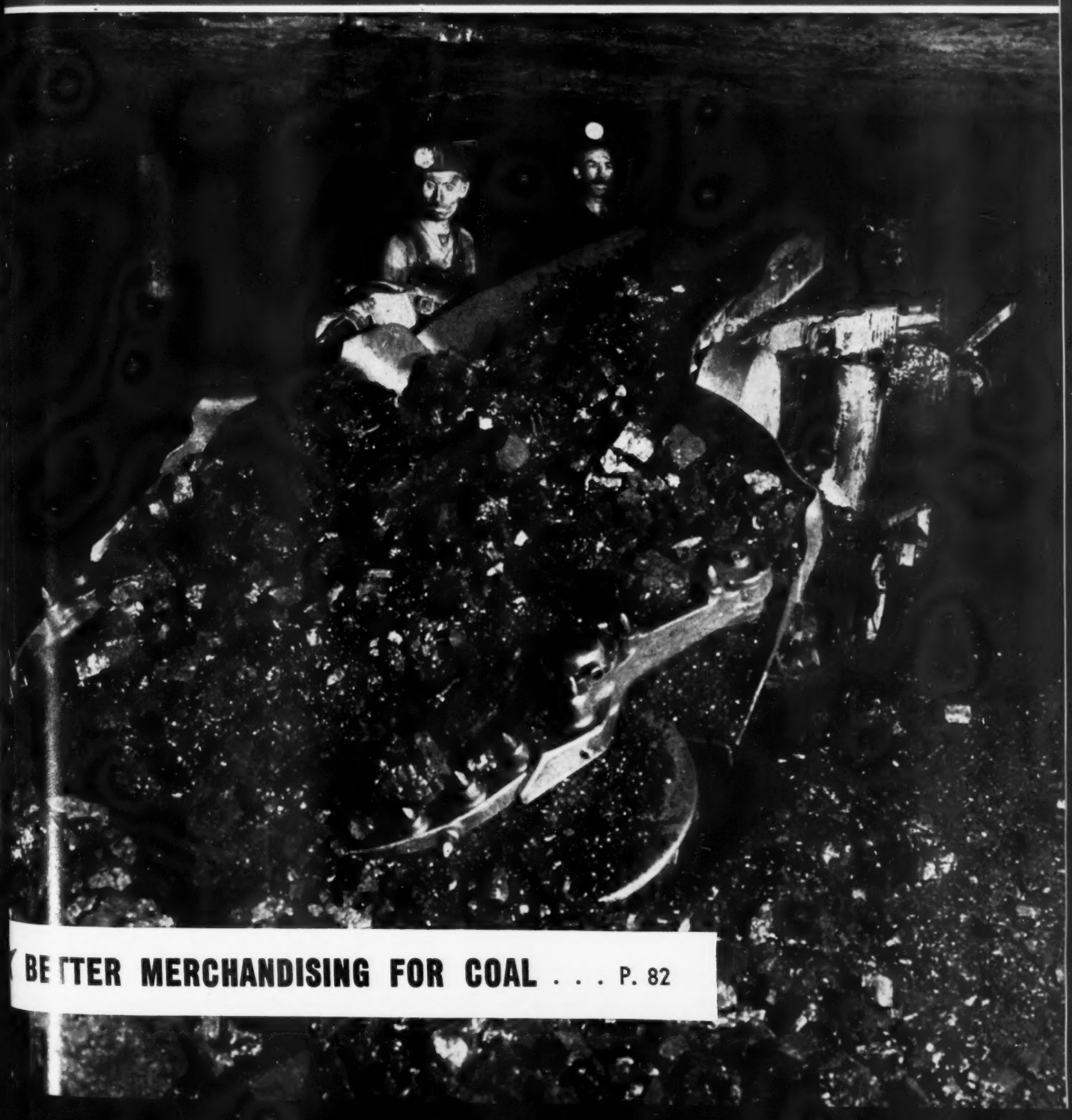
Coal Age

OCTOBER, 1945



BETTER MERCHANDISING FOR COAL . . . P. 82

$1,500 THAT'S A LOAD OF SAVINGS

SUN MINE LUBRICANTS . . . Eliminate 80% of Loading-Machine Shutdowns for Greasing, End Gummy Deposits

A Sun Engineer was called in to investigate a mine's loading-machines. Complaints were: High grease-consumption, separation of the grease, gummy deposits.

Complete cleaning of the transmission-case and gathering-heads had to be scheduled every two or three days to avoid serious breakdowns.

After careful study of the mine-water, operating-conditions, and other factors, the Sun Engineer recommended a specially refined grease, designed for long service.

With the Sun Grease, the loading-machines now are cleaned only one-seventh as often as before. Savings in man-power alone amount to over $30 a week, or $1,500 a year. In addition, equipment is on the job, day and night, without fail. Grease-consumption has been cut to one-sixth, and the new grease does not separate or wash out.

To produce more coal, this Winter or any season, get the Sun man near you to help keep every machine working full time. Call the Sun office near you. Or write . . .

SUN OIL COMPANY • *Philadelphia 3, Pa.*

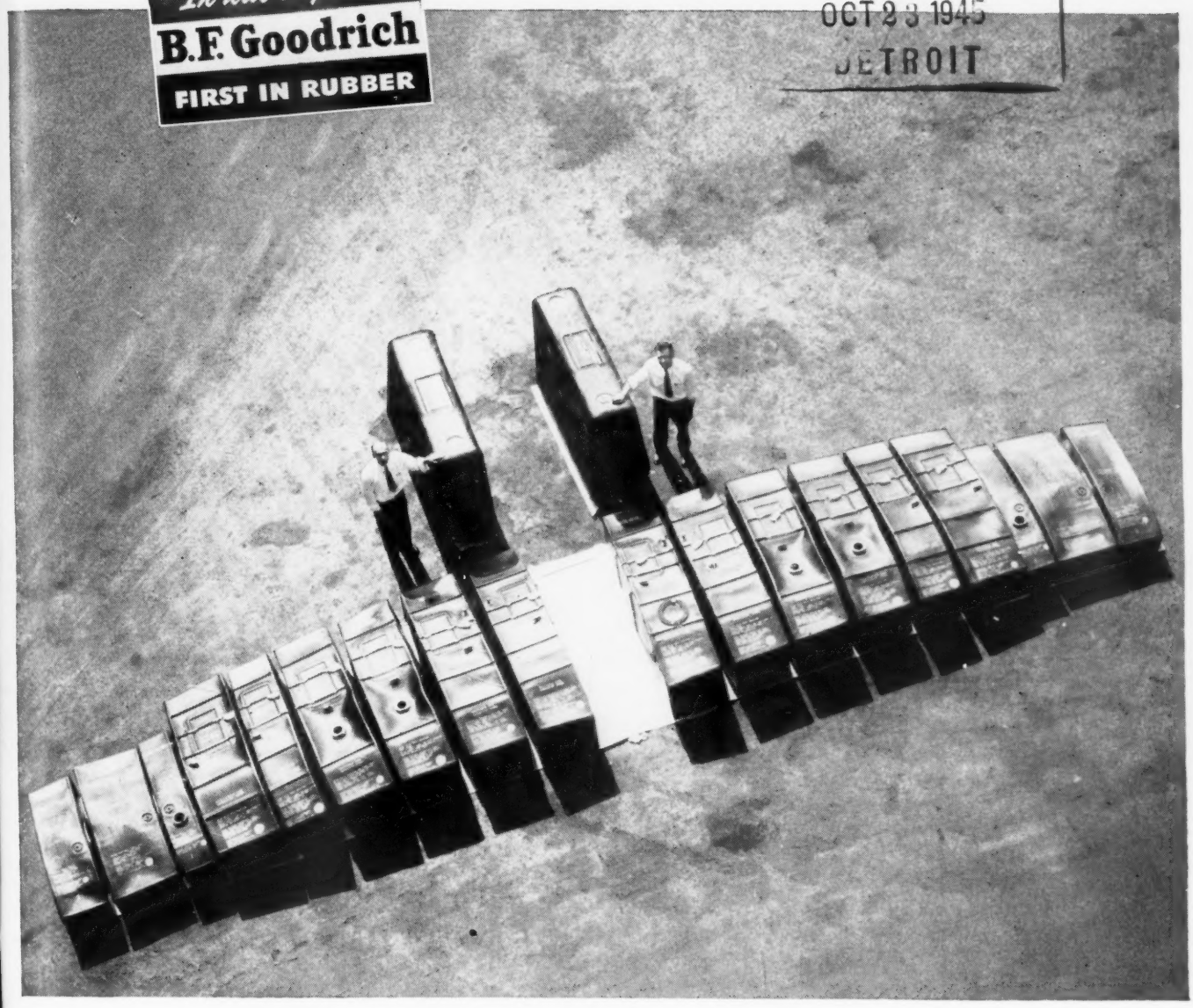
Sponsors of the Sunoco News-Voice of the Air — Lowell Thomas

SUNOCO **SUN INDUSTRIAL PRODUCTS**

OILS FOR AMERICAN INDUSTRY

C LIBRARY
OCT 2 3 1945
DETROIT

In war or peace
B.F.Goodrich
FIRST IN RUBBER



Flight formation for 3,000 gallons of gas

A typical example of B. F. Goodrich development in rubber

THOSE 20 tanks, arranged just as they are in the plane, are what it takes to carry the fuel for a Liberator bomber. They hold enough gasoline to last the average car owner four or five years. Enemy bullets won't hurt them because they're the bullet-sealing fuel cells made by B. F. Goodrich and developed early in the war.

But even though they sealed bullet holes they had the dangerous habit, at first, of springing leaks miles inside enemy territory. Metal parts of the tanks—fill pipes, for example—tore loose from the soft rubber walls of the tanks under the constant vibration of the plane in flight.

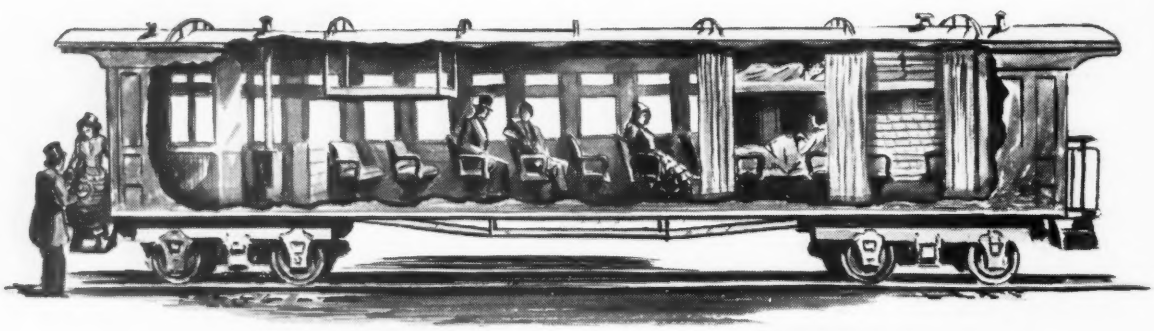
Some kind of stronger cement was needed to bond rubber to metal, and the government asked for one that would stand a 35-pound pull. B. F. Goodrich men worked on the problem, developed "Plastilock 102" that stands 85 pounds. Since it has been used, service failures have dropped to almost nothing.

The rubber cement you may use at home is only one of hundreds of adhesives B. F. Goodrich makes for hundreds of applications in industry. And adhesives are only one group of thousands of products this company makes. In every one of them development is going on constantly, so that the rubber product you used last year is probably better today and will be still better next year. *The B. F. Goodrich Company, Akron, Ohio.*

B.F. Goodrich

RUBBER *and* SYNTHETIC *products*

First in its Field



First Pullman Sleeping Car

PHILADELPHIA — PA.

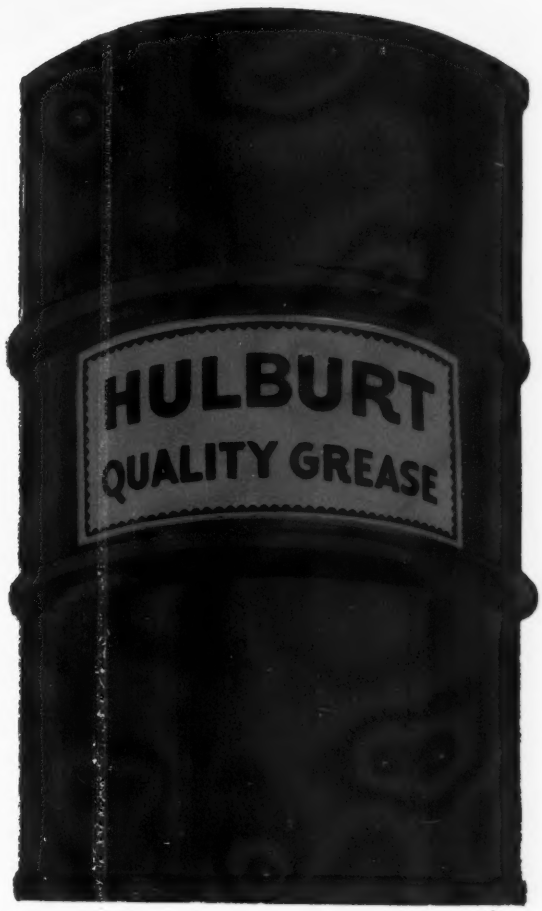
"Old No. 9" was built by Benjamin Field and George M. Pullman in 1859. Construction was wood. The roof was flat and low. Seats were hard, fixed. Two small stoves furnished heat. It was lighted with candles. There were 10 upper and 10 lower berths; mattresses and blankets were furnished, no sheets. The first comfortable Pullman Sleeping Car was built in 1865.

The "first name" in Quality Grease for Coal Mine Lubrication is Hulburt. Its development has kept pace with the development of Coal Mining Equipment — today it represents to wideawake coal men the "last word" in lubricating Grease to insure the most service and least trouble for mining machines, with the help of Hulburt Engineers who work down in the mine.

HULBURT OIL & GREASE COMPANY . . PHILADELPHIA, PENNA.

Specialists in Coal Mine Lubrication

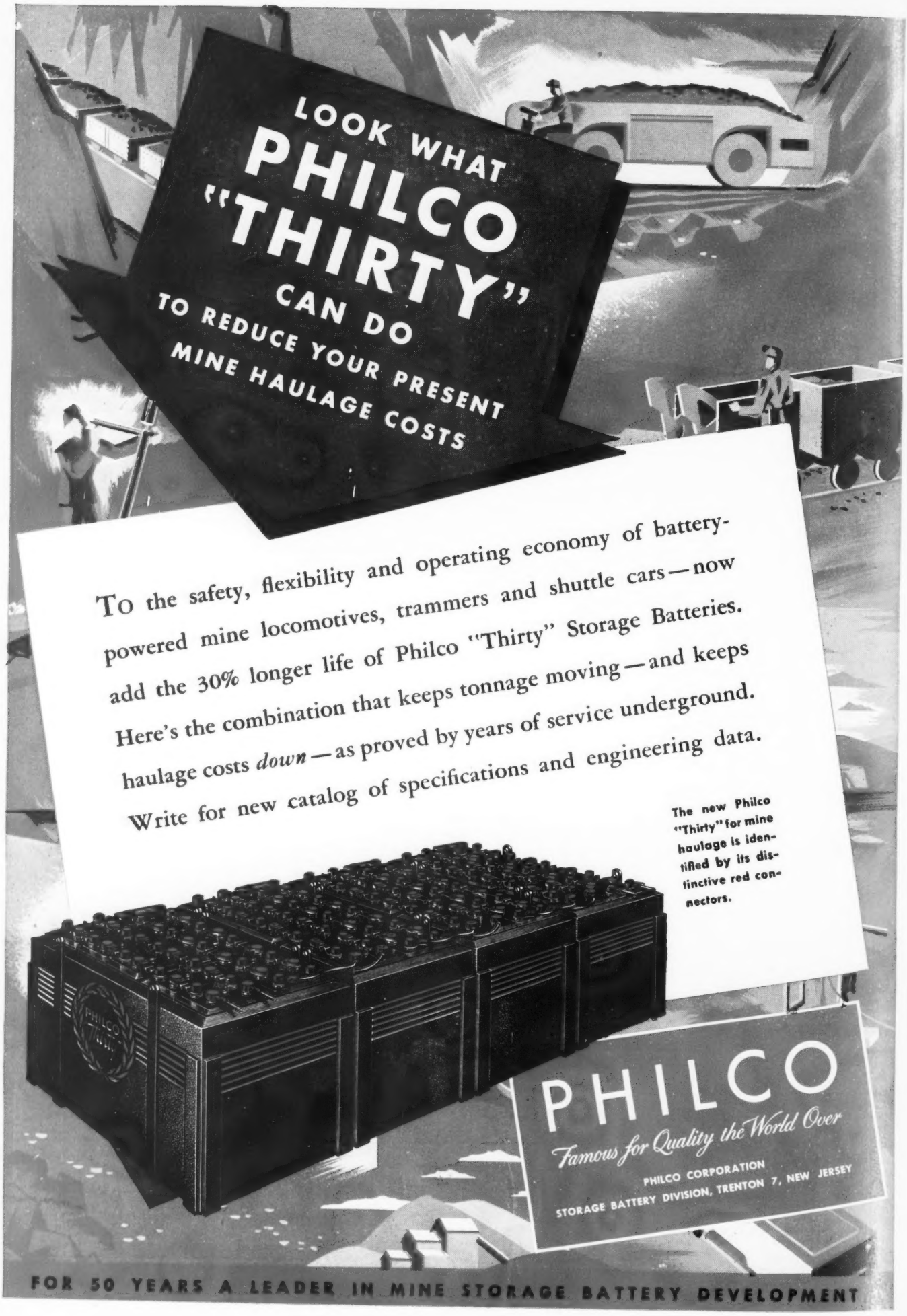
..a record of
American Leadership



HULBURT

THE "FIRST NAME" IN

Quality GREASE


LOOK WHAT
PHILCO
"THIRTY"
CAN DO
TO REDUCE YOUR PRESENT
MINE HAULAGE COSTS
To the safety, flexibility and operating economy of battery-powered mine locomotives, trammers and shuttle cars—now add the 30% longer life of Philco "Thirty" Storage Batteries. Here's the combination that keeps tonnage moving—and keeps haulage costs *down*—as proved by years of service underground.
Write for new catalog of specifications and engineering data.
The new Philco "Thirty" for mine haulage is identified by its distinctive red connectors.
PHILCO
Famous for Quality the World Over
PHILCO CORPORATION
STORAGE BATTERY DIVISION, TRENTON 7, NEW JERSEY
FOR 50 YEARS A LEADER IN MINE STORAGE BATTERY DEVELOPMENT

Coal Age

Alfred M. Staehle, *Publisher*

IVAN A. GIVEN, *Editor*

R. Dawson Hall J. H. Edwards

Louis C. McCarthy Fred W. Richart

R. R. Richart

Maj. Charles H. Lambur, Jr. *(on leave)*

H. R. Mathias, *Sales Manager*

A McGRAW-HILL PUBLICATION

COAL AGE (with which is consolidated "The Colliery Engineer" and "Mines and Minerals") is published monthly on the 1st. Allow at least ten days for change of address.

Subscription rates: United States, Mexico, Central and South America, $3 for one year, $4 for two years, $5 for three years. Canada, $3.00 for one year, $5 for two years, $6 for three years. Great Britain and British Possessions, 30 shillings for one year, 60 shillings for three years. All other countries, $5 for one year, $10 for three years. Single copies, 35 cents each. Entered as second class matter Oct. 14, 1936, at the Post Office at Albany, N. Y., under the Act of March 3, 1879. Printed in the U. S. A. Cable Address: "McGraw-Hill, N. Y." Member A.P.B. Member A.B.C. Please indicate position and company connection on all subscription orders.

•

Return Postage Guaranteed

Contents Copyright 1945 by McGraw-Hill Publishing Co., Inc.; all rights reserved.

JAMES H. McGRAW
Founder and Honorary Chairman

JAMES H. McGRAW, JR.
President

CURTIS W. McGRAW
Senior Vice President and Treasurer

HOWARD EHRLICH
Vice President
for business operations

WILLARD CHEVALIER
Vice President
for editorial operations

JOSEPH A. GERARDI, Secretary

J. E. BLACKBURN, JR.
Director of Circulation

Publication office, 99-129 North Broadway, Albany 1, N. Y. Editorial and executive offices, 330 West 42d St., New York 18, N. Y. Branch offices: 520 North Michigan Ave., Chicago, 11; 68 Post St., San Francisco, 4; Aldwych House, Aldwych, London, W.C. 2; Washington, 4; Philadelphia, 2; Cleveland, 15; Detroit, 26; St. Louis, 1; Boston, 16; Atlanta, 3; Los Angeles, 14; 738-9 Oliver Building, Pittsburgh 22.

All communications about subscriptions should be addressed to the Director of Circulation, Coal Age, 330 West 42d St., New York 18, N. Y.

District Managers: T. E. Alcorn and F. W. Roets, New York; W. A. Potter, Philadelphia; W. M. Spears, Cleveland; W. S. Drake, Pittsburgh; S. J. Alling, Chicago; C. J. Coash, St. Louis.

CONTENTS

Volume 50 **OCTOBER, 1945** *Number 10*

Key to More Business for Coal: Better Merchandising 82

Machine Loading—Taking Top and Coal Raises Entry Output . 88
By J. H. EDWARDS

Stripping Improvements Mark Rimersburg Expansion 93

Better Wheel Welding Achieved With Hidden-Arc Process .. 97

Increased Safety Goal in New Mining and Ventilating Plan 100
By RICHARD McGEE

Coal in Europe: Serious Shortage Reflects Production Lag .. 102
By C. J. POTTER

Getting Results in Maintaining Coal-Preparation Plants 105
By FRED W. RICHART

How to Clean Electric Motors, Windings and Insulation 111
By D. L. GIBSON

Shuttle-Car Battery Boosted While Working 124

Welded Patches Prolong Bumper Life 126

Gage Measures Pressure in Air Hose 128

Gate in Hydro-Separator Saves Coal From Refuse 128

Locomotive With Bulldozer Cleans Track 130

32-Volt Control Cures Braking Trouble 130

Welding Reconditions Journal Boxes 132

New Trough Support to Last Longer 132

Portable Curtain Speeds Ventilation Control 134

Locomotives Given Operating Tests Without Moving 134

Air-Driven Tools Occupy Special Rack 136

Scrap Steel Improves Swivel Jack 136

Editorials 81

Foremen's Forum ..... 116 **Questions and Answers** ... 120

News Round-Up ..... 139 **Equipment News** 178

CHANGE OF ADDRESS

Director of Circulation, COAL AGE,
330 West 42d St., New York 18, N. Y.

Please change the address of my COAL AGE subscription as follows:

Name .....

Old Address .....

New Address .....

New Company Connection .....

New Title or Position .....

If a man can lift a hammer, he can install . . .

BETHLEHEM'S No. 5 STEEL TIE

Easy? It's easy as falling off a log.

Slip a No. 5 under the rails; then, with a hammer, tap the revolving clips into place. There's your tie, completely installed, with the rails true to gage. And it's taken only a couple of minutes—possibly less.

But consider these other advantages, too:

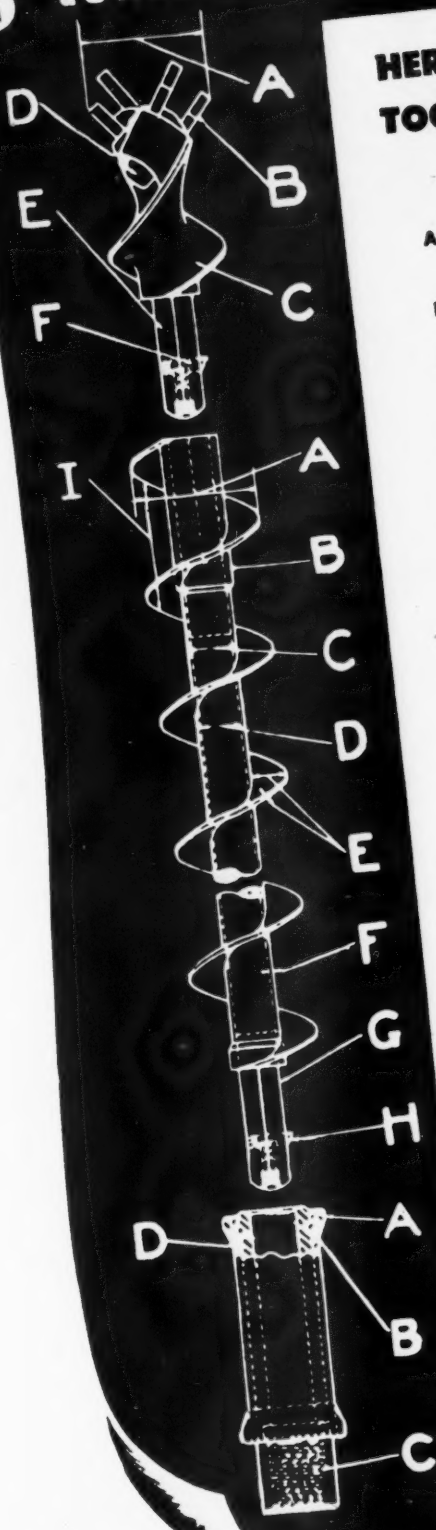
Bethlehem's No. 5 Tie is built specifically for use with 40-pound rail—built to handle the full weight of your heaviest equipment. It's sturdy, rigid, durable; easily outlasts several wooden ties. Yet you can pick it up with one hand, for it weighs only 5 pounds per foot.

No spiking . . . no gaging . . . little or no maintenance. Stout, solid track that doesn't spread. Faster placing of cars . . . fewer derailments. These are the ways you save with No. 5's in your room track.

Always ask for these red steel ties by name. Thousands are now in service. You'll find out why when you try them.

BETHLEHEM STEEL

COALMASTER AUGER ASSEMBLY FEATURES



HERE'S WHY COALMASTER "MATCHED SET" TOOLS DRILL BETTER — FASTER — CHEAPER

HEADS

A. **DIAMETER OF HOLE.** Coalmaster Assemblies drill a wide range of hole sizes from 1⅝ to 16" in diameter for any type of operation in underground and strip mining.

B. **BITS.** Coalmaster special alloy steel bits are scientifically designed and heat-treated to give low bit cost in all classes of drilling.

C. **HEADS.** Coalmaster cast steel heads are heat-treated and hard-surfaced to give extra wear. Their special design and construction assures accurate drilling.

D. **WEDGE.** Coalmaster patented wedges assure tightly held bits and, as a result, true clean holes.

E. **HEAD SHANK.** The Coalmaster patented hexagon shank fits snugly into the socket and provides the most efficient and vibration-free coupling available.

F. **HEXANSPEED ASSEMBLY.** Coalmaster Hexanspeed Assembly is a simple, long-wearing, trouble-free mechanism which reduces auger changing time to a minimum and speeds up hole production ten to thirty per cent.

AUGERS

A. **AUGER DIAMETER.** The special welded-spiral construction of Coalmaster augers permits flexibility in auger construction to meet any specific requirements.

B. **SOCKET.** Patented Hexagon Coalmaster Sockets are broached to give a close coupling tolerance.

C. **OUTSIDE DIAMETER OF TUBE.** Coalmaster augers are constructed with special alloy steel tubes in varying diameters for holes from 1⅝" to 16".

D. **INSIDE DIAMETER OF TUBE.** Tubular construction combines rigidity and light weight in all Coalmaster augers.

E. **SPIRAL THICKNESS AND WIDTH.** The spiral widths and thicknesses of Coalmaster augers vary with the diameter of the auger and the size of the hole to be drilled.

F. **GAUGE OF TUBE.** Coalmaster augers are made with correct tube gauge to allow for the proper factor of safety in torque strength.

G. **AUGER SHANK.** Coalmaster shanks give that quick make-and-break coupling which is becoming standard with an increasingly large number of mines.

H. **HEXANSPEED ASSEMBLY.** The same efficient Hexanspeed Assembly is used on the auger shank as on the head shank. A simple tool uncouples the head or the auger. No fuss, no bother, no lost time in changing augers.

I. **PITCH.** Coalmaster augers are designed with the most effective pitches to provide scientific conveyance.

DRILL SOCKETS

A. **OUTSIDE SLEEVE.** For positive protection the safety sleeve permits the driller to handle the thread bar without danger to himself.

B. **BALL BEARING.** The ball bearings in the sleeve permit operation with minimum friction.

C. **THREADS.** Coalmaster Drill Sockets are threaded to fit thread bars of all leading Electric Drills.

D. **TUBE.** The tube is made of special alloy steel.

DRILLING COALMASTER TOOLS

CENTRAL MINE EQUIPMENT CO.

ST. LOUIS 8, MO.

A TIME SAVER . . .
A TONNAGE PRODUCER

The Goodman Type 460 loader. Built specially for high capacity loading on sharp curves and in close posting.

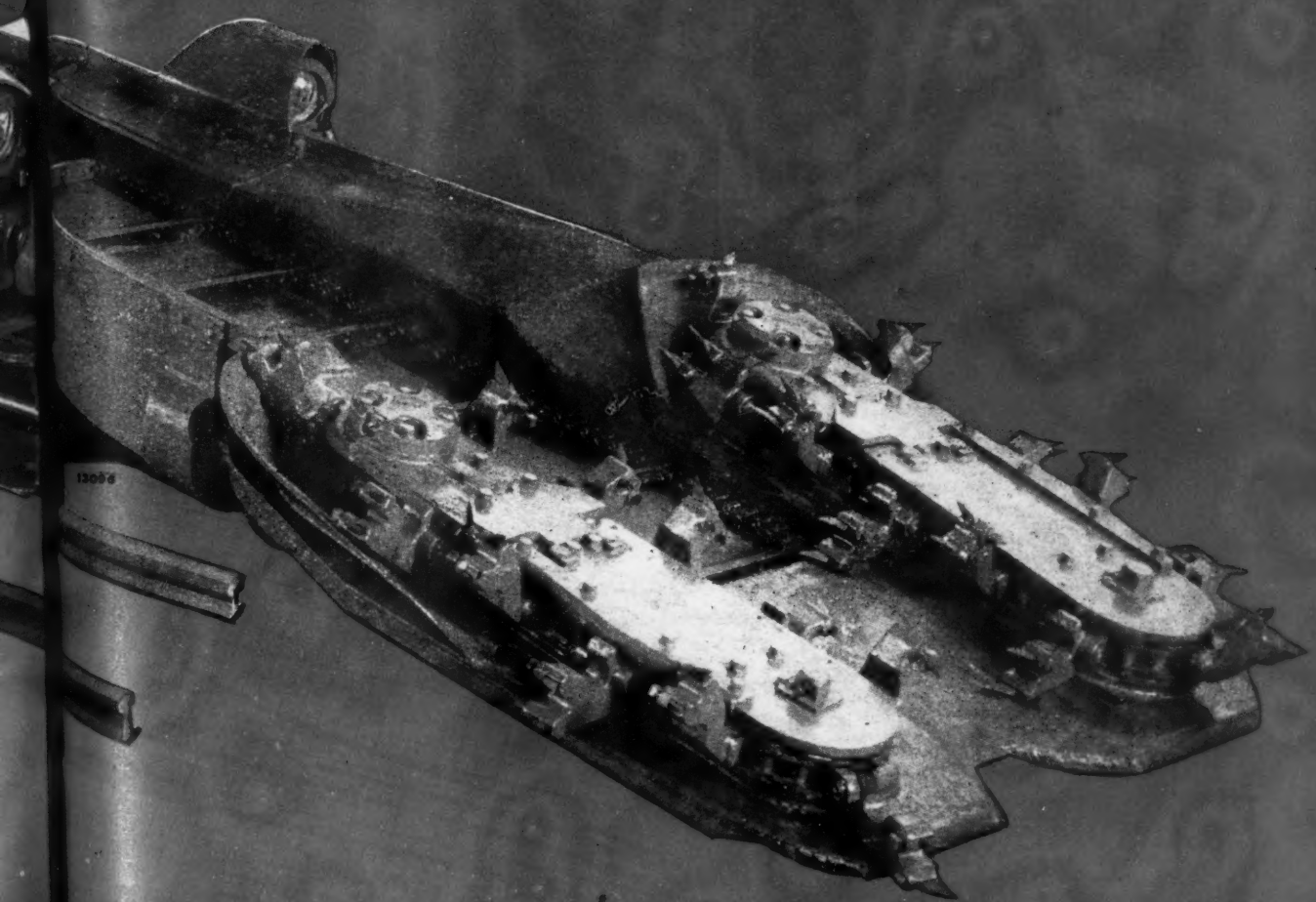
ARMY E NAVY

GOODMAN MANUFACTURING COMPANY

GOODMAN
TRACK MOUNTED LOADER

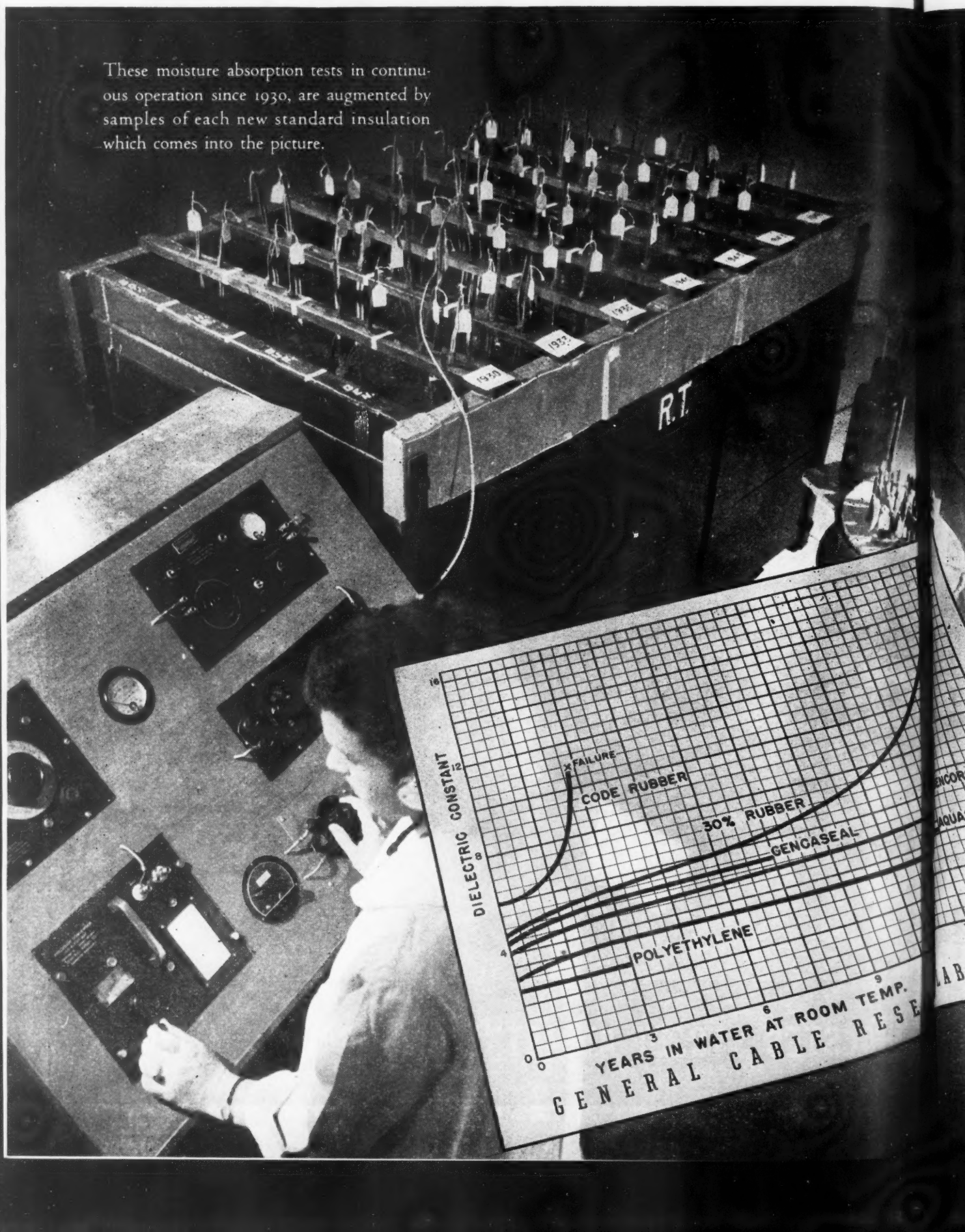
119 cars loaded in 30 places by a 23-man crew for a total of 1128 tons—in one shift with one Goodman loader! That's a record recently established in the No. 8 Ohio seam where the coal is 5 feet thick and underlies 12 inches of slate that is loaded with the coal.

Details of this operation may be helpful to you. A Goodman sales engineer will be glad to give them to you, and he'll probably be able to tell you of a new record too, as this same mine was shooting at 1200 tons with every expectation of bettering even that.



HALSTED STREET AT 48TH • CHICAGO 9, ILLINOIS

RESEARCH . . .


These moisture absorption tests in continuous operation since 1930, are augmented by samples of each new standard insulation which comes into the picture.
R.T.
DIELECTRIC CONSTANT
FAILURE
CODE RUBBER
30% RUBBER
GENCASEAL
POLYETHYLENE
YEARS IN WATER AT ROOM TEMP.
GENERAL CABLE RESE

. . . BY DECADES

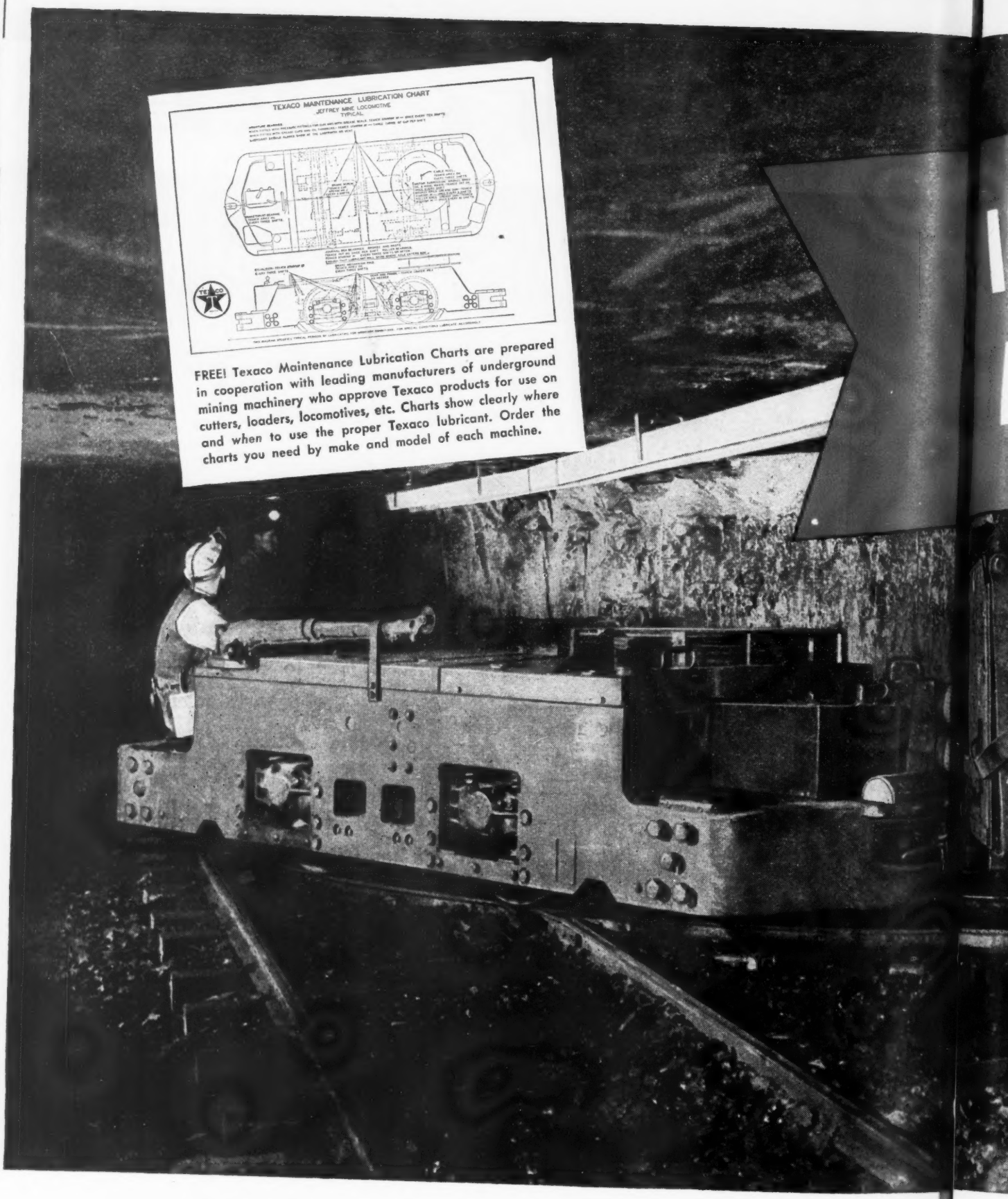
Preparedness for Post-War Industry Developments based on cumulative data long in preparation

In the comparison of rubber insulating compounds and the new synthetics, it is easy and hazardous to jump at conclusions. Through the years, General Cable has been broadening its base of data by which to predict with some assurance the performance to be expected of the new materials. And out of practical experience, it recognizes, too, that there is no substitute for time in the determination of the industry's final answers.

These and other tests, extending over years of simulated service conditions, prepare General Cable to furnish synthetic insulations for all operating conditions.

GENERAL CABLE CORPORATION

General Cable Corporation Sales Offices are located at Atlanta, Boston, Buffalo, Chicago, Cincinnati, Cleveland, Dallas, Detroit, Houston, Kansas City (Mo.), Los Angeles, New York, Philadelphia, Pittsburgh, Rome (N.Y.), St. Louis, San Francisco, Seattle, Washington (D. C.)


TEXACO MAINTENANCE LUBRICATION CHART
JEFFREY MINE LOCOMOTIVE
TYPICAL
FREE! Texaco Maintenance Lubrication Charts are prepared in cooperation with leading manufacturers of underground mining machinery who approve Texaco products for use on cutters, loaders, locomotives, etc. Charts show clearly where and when to use the proper Texaco lubricant. Order the charts you need by make and model of each machine.
TEXACO
REG. T. M.
TEXACO LUBRICANTS

INCREASE LIFE OF ANTI-FRICTION BEARINGS

By using the bearing lubricant that . . .

- ★ **Resists oxidation, gum formation**
- ★ **Resists separation and leakage**
- ★ **Stays in the bearing longer**

TEXACO REGAL STARFAK gives you all of these highly desirable lubricating qualities and, in addition, saves you power because it reduces starting torque, even at low temperatures. These are some of the reasons why mine operators throughout the country use *Texaco Regal Starfak* to assure longer life, more trouble-free service from grease-lubricated ball and roller bearings of electric locomotives, loaders, mine cars and similar equipment.

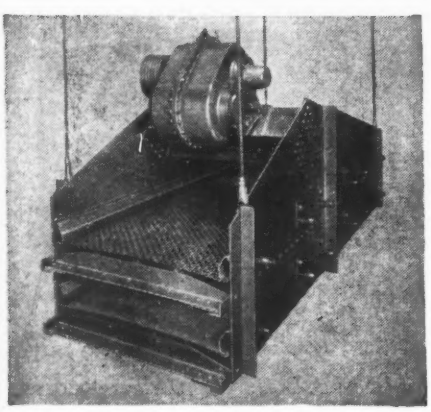
Texaco Regal Starfak is a typical example of a petroleum product improved through The Texas Company's constant research. It is especially designed for anti-friction bearing lubrication, and is processed by modern Texaco methods in one of the world's largest refineries. Absolute uniformity is assured by the constant supervision of skilled and experienced technicians.

Texaco Lubrication Engineering Service is available through more than 2300 Texaco distributing plants in the 48 States. Get in touch with the nearest one, or write The Texas Company, 135 East 42nd Street, New York 17, N. Y.

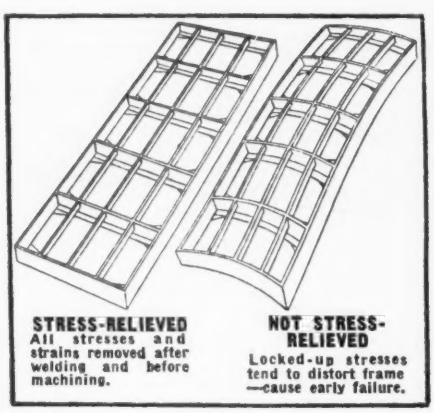
For the Coal Mining Industry

"LOW-HEAD"

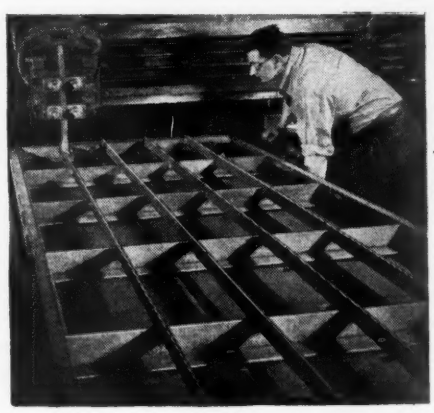
HERE'S A MULTI-PURPOSE SCREEN THAT OPERATES HORIZONTALLY--SAVES SPACE, CUTS INSTALLATION COSTS!



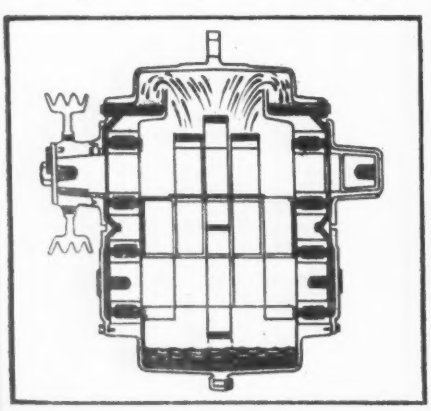
1 Want to remodel, but find that *inclined* screens require building changes? "Low-Head" Vibrating screens may be your answer. Reason: They operate *horizontally*—save headroom and space!


STRESS-RELIEVED
All stresses and strains removed after welding and before machining.
NOT STRESS-RELIEVED
Locked-up stresses tend to distort frame —cause early failure.

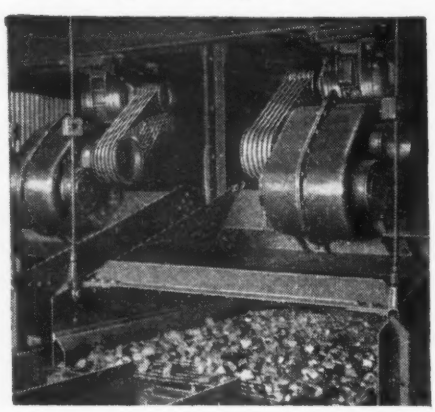
2 A-C guards against failure in the field by *"stress-relieving"* side plates and frames. That means *uniformly* strong bodies — the ability to *resist* damaging vibration year after year!



3 One user reports he's getting *up to double* cloth life! Good reason is A-C research in development of support frames with adequate strength and correct crown for different grades of surfaces.

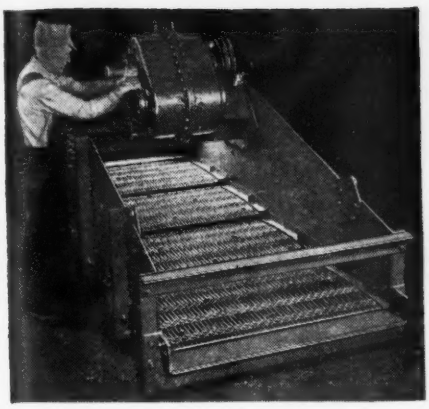


4 Operators like this compact mechanism—it's *easy* to inspect. And they don't worry about dust or oil. Mechanism is *totally enclosed*—gears and bearings are *continuously* splash-lubricated!

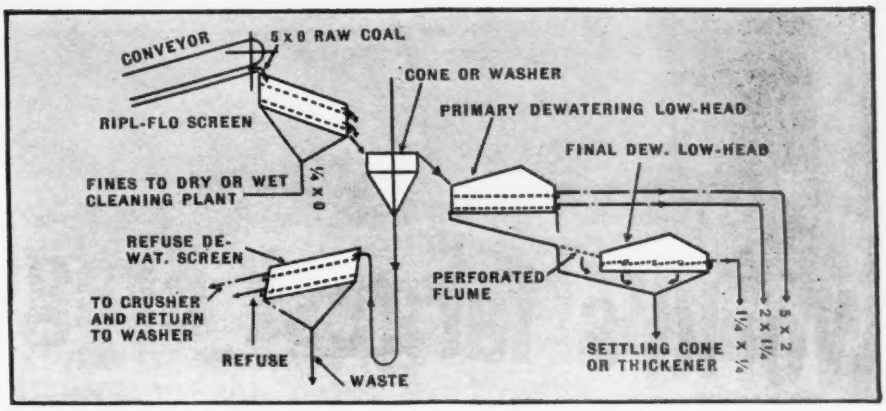


5 Two of many "Low-Head" screens speeding-up vital U.S. coal output. You'll find others at work on a wide range of products . . . from gravel and metallic ores to wood chips and foundry sand!

6 "Low-Head" screens are *versatile* —not only save you headroom, but can be used for wet or dry screening, dewatering, rinsing! For details on these modern screens, send for bulletin B6330.

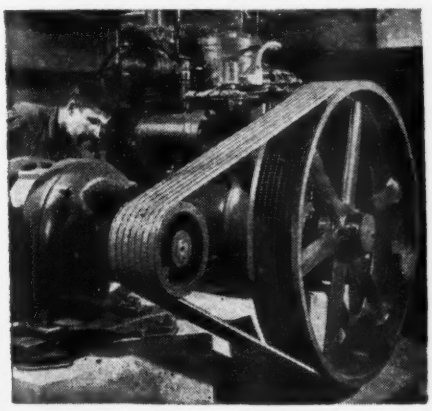


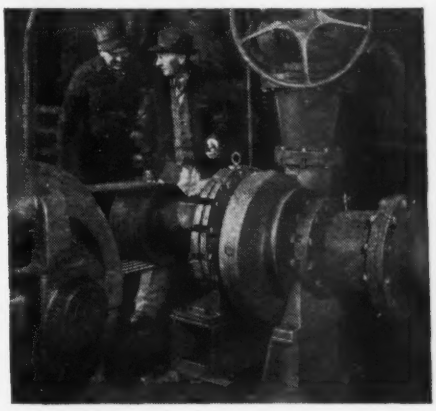
7 Cooperating with tipple manufacturers, A-C is offering a *new* screen deck—the "End-Tension" deck—*which recovers saleable coal* from sludge—assures *maximum* dewatering efficiency.



8 Schematic flow sheet shows *final dewatering* "Low-Head" screen with new "End-Tension" deck—preceded by *primary dewatering* standard "Low-Head" screen—and "Ripl-Flo" raw coal screen.

9 One operator reports that surface moisture on 13/16 x 14 mesh coal *is reduced 4%* with end-tensioned deck "Low-Head" screen which replaced a conventional shaker type screen.





10 A-C is the *only* company that builds basic processing equipment *plus* motors, controls, Texrope drives. That means *unit-responsibility*—no "buck-passing"!

11 Planning ahead for more efficient power distribution in your plant? This scale model "Unit Substation Builder Set" can help you plan *visually*—saves time!

12 New type "CW" Pump lowers cost-per-ton of *solids* handled over similar units—is representative of performance on other A-C pumps rated from 10 to 150,000 gpm.

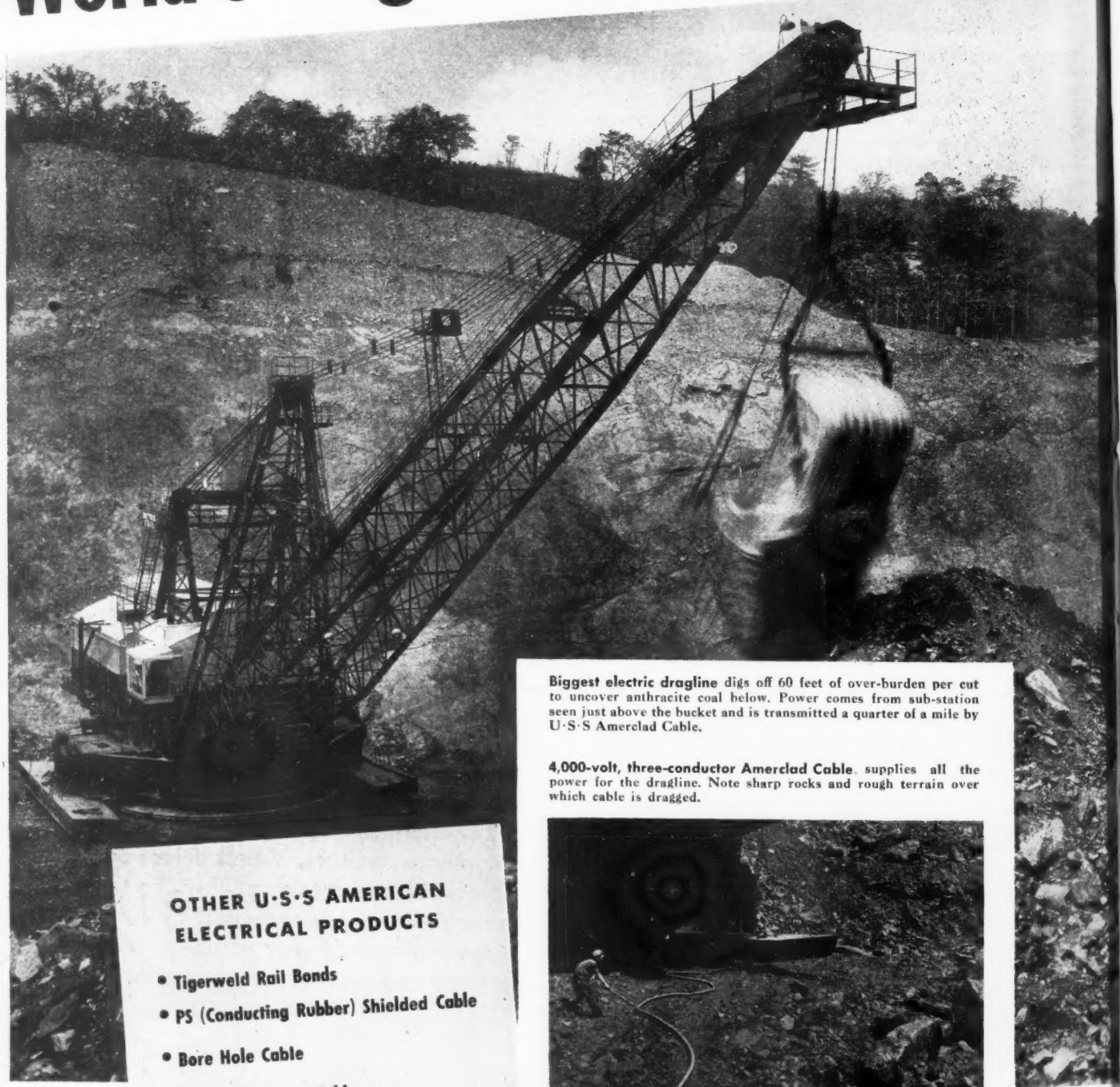
YOU CAN DEPEND ON A-C RECOMMENDATIONS!

Allis-Chalmers builds *7 major lines,* many types and styles of basic equipment for coal producers. When you need screens, for example, you can select from 4 *different* styles. Same holds true for pumps, motors, V-belt drives . . . almost *everything* A-C builds for coal! What does this mean to you? For one thing, *greater choice* — assurance that the equipment A-C recommends will be suited to the *exact* job to be done . . . isn't just an *improvised* way of doing it! A.1881

ALLIS A-C CHALMERS

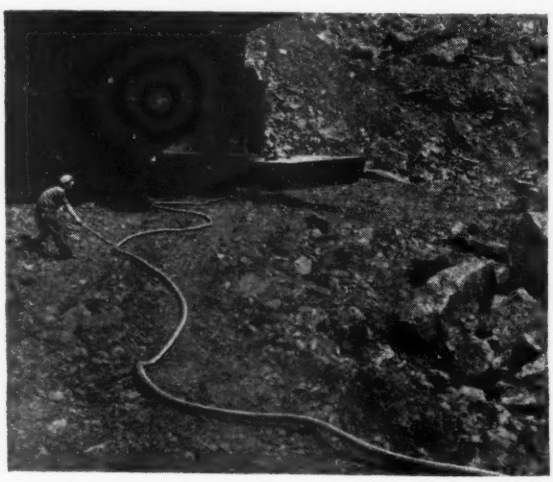
MILWAUKEE 1, WIS.

World's largest dragline powered



Biggest electric dragline digs off 60 feet of over-burden per cut to uncover anthracite coal below. Power comes from sub-station seen just above the bucket and is transmitted a quarter of a mile by U·S·S Amerclad Cable.

4,000-volt, three-conductor Amerclad Cable supplies all the power for the dragline. Note sharp rocks and rough terrain over which cable is dragged.



OTHER U·S·S AMERICAN ELECTRICAL PRODUCTS

- Tigerweld Rail Bonds
- PS (Conducting Rubber) Shielded Cable
- Bore Hole Cable
- Amerclad Shovel Cable
- Ampyrol Resin-insulated Cable

with AMERCLAD

Scoops up 25 cu. yds. of rock in one bite!

THIS mammoth dragline is used for stripping over-burden in the anthracite coal fields nears Pottsville, Pa. It was built by Bucyrus-Erie for the Correale Construction Company of Hazelton and is in operation at the Beechwood Coal Stripping Project of the Philadelphia and Reading Coal and Iron Company.

The huge electric excavator can dig 140 feet deep and dump the load as far as 360 feet away by means of the 180-foot boom.

A most amazing sight is to see this machine which weighs 2,410,000 pounds *walk* from one location to another! It takes 7½ foot steps at a time on two big shoes that look like barges and are operated by cams working in a frame.

It takes 1250 h.p. to operate this dragline. Power is supplied through a 4,000-volt, 3-conductor cable designed especially for the job by engineers of the American Steel & Wire Company. Due to the fact that the cable drops over a high cliff, it had to be made self-supporting. Ground wires in the cable protect workmen from danger in case they accidentally cut through the covering with sharp tools.

The cable has been in operation since September, 1944. Loaded trucks have run over it without damage to the tough rubber jacket. It is constantly being dragged over sharp rocks but has given reliable service ever since it was installed.

American Steel & Wire Company stands ready to meet your electrical cable requirements. We make all the standard types such as locomotive gathering reel cable, digging and loading machinery cable, power-house and power-line wire and many others. You can also get special cable designed to meet your particular conditions. Write for details.

American Steel & Wire Company

For Anthracite Service: Miners Bank Building, Wilkes-Barre, Pa.

Cleveland, Chicago and New York

United States Steel Export Company, New York

UNITED STATES STEEL

1. Flexible Stranded Conductor
2. Insulation
3. Rubber-filled tape
4. "Semi-Conducting" PS tape
5. Amerclad Tough Rubber Jacket

EVERY SUNDAY EVENING, United States Steel presents *The Theatre Guild on the Air.* American Broadcasting Company coast-to-coast network. Consult your newspaper for time and station.

AMERICAN STEEL & WIRE COMPANY · USS STEEL · UNITED STATES STEEL

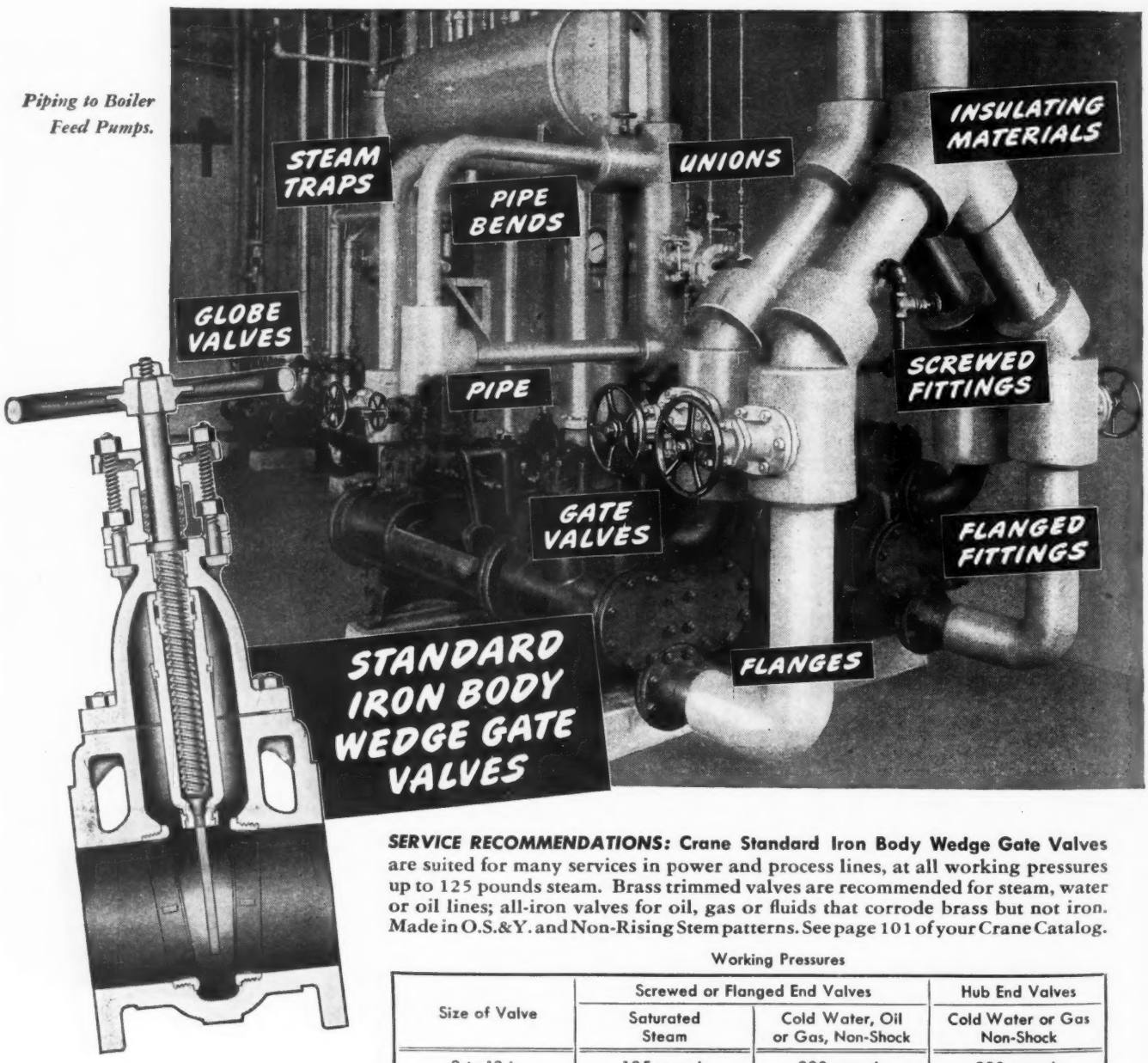
U·S·S Amerclad Cables

IT'S CRANE
. . . For ALL Piping Materials

ONE SOURCE OF SUPPLY • ONE RESPONSIBILITY • ONE STANDARD OF QUALITY

By choosing Crane piping materials, you always have the advantage of the world's greatest selection—in brass, iron and steel. One source—your Crane Branch or Wholesaler—takes care of all your requirements. Thus, you are assured of uniform quality in all parts of piping systems—with single responsibility behind them. And because Crane complete piping material service simplifies ordering, it speeds up deferred replacement work . . . helps keep piping at peak efficiency. A typical Crane solution for many of your valve application problems is shown below.

Piping to Boiler Feed Pumps.



SERVICE RECOMMENDATIONS: **Crane Standard Iron Body Wedge Gate Valves** are suited for many services in power and process lines, at all working pressures up to 125 pounds steam. Brass trimmed valves are recommended for steam, water or oil lines; all-iron valves for oil, gas or fluids that corrode brass but not iron. Made in O.S.&Y. and Non-Rising Stem patterns. See page 101 of your Crane Catalog.

Working Pressures

Size of Valve	Screwed or Flanged End Valves		Hub End Valves
	Saturated Steam	Cold Water, Oil or Gas, Non-Shock	Cold Water or Gas Non-Shock
2 to 12 in.	125 pounds	200 pounds	200 pounds
14 and 16 in.	125 pounds	150 pounds	150 pounds
18 to 24 in.	*	150 pounds	150 pounds

*For steam lines larger than 16-in., Crane 150-Pound Cast Steel Gate Valves are recommended. (For sizes under 2-in., use Crane Clamp Gate Valves.)

CRANE CO., General Offices: 836 S. Michigan Ave., Chicago 5, Ill. • *Branches and Wholesalers Serving All Industrial Areas*

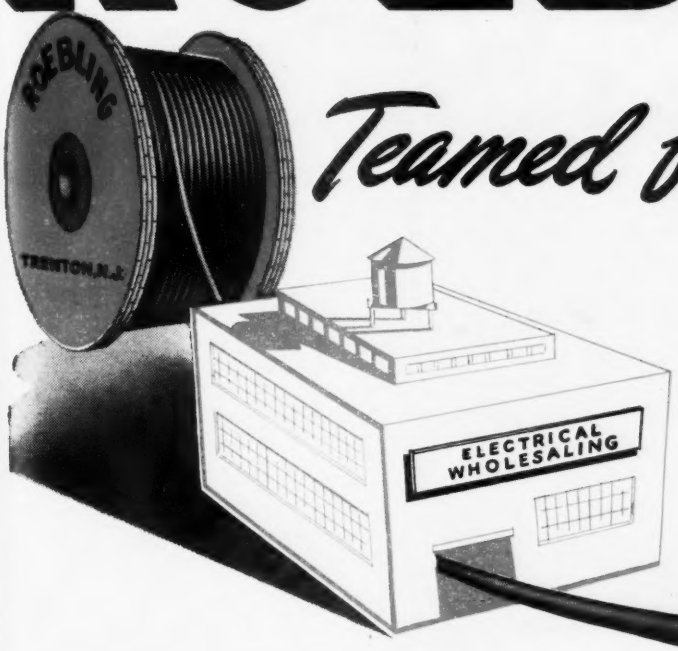
CRANE

90 YEARS OF PROGRESS 1855 1945

VALVES • FITTINGS • PIPE
PLUMBING • HEATING • PUMPS

ROEBLING

Teamed for your Profit!



1. The finest in electrical wires and cables from ROEBLING

2. The best in service from ROEBLING ELECTRICAL WHOLESALERS

EVER STOP TO THINK that the best products in the world aren't very helpful unless you get them when and where you want them? And at the right price?

Thank your electrical wholesaler for that part of a job well done . . . even under the strain of total war, with increased demands and limited supplies.

That's why Roebling will continue to team up with electrical wholesalers now and always. We'll do our part of the job with a complete line of wire and cable that embodies every modern development and assures the best possible service. Roebling wholesalers will see that you get them, and hundreds of other fine electrical products too.

Roebling and your local wholesaler . . . it's a team that you can't beat when you want the best products and service. Teamed for *your* profit!

JOHN A. ROEBLING'S SONS COMPANY
TRENTON 2, NEW JERSEY
Branches and Warehouses in Principal Cities
Roebling Wholesalers in Strategic Localities

JR ROEBLING

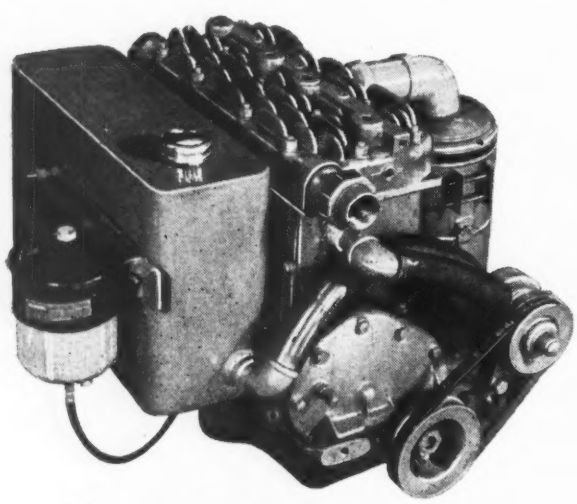
ROEBLING ELECTRICAL WIRES AND CABLES

WEATHERPROOF WIRE • RUBBER COVERED WIRES AND CABLES (INCLUDING THIN-WALL INSULATED BUILDING WIRES AND CABLES) • SERVICE ENTRANCE CABLES • RUBBER INSULATED POWER CABLES • TROLLEY CONTACT WIRE RUBBER SHEATHED PORTABLE CABLES • VARNISHED CAMBRIC POWER CABLES BARE COPPER STRAND • PIGTAIL AND BRAIDED COPPER • MAGNET WIRE TELEPHONE WIRES

PACEMAKER IN WIRE PRODUCTS

THE CANTRELL S-101 AIR COMPRESSOR IS A "MUST" BUY!

We believe this Cantrell S-101 is the lowest priced compressor unit on the market. But, we know, it will give you maximum efficiency because it is designed especially to meet every requirement of coal mines, and hundreds of them now in use, have proved their dependability in constant service and satisfaction.



The two views above show the Cantrell S-101 Air Compressor completely.

The S-101 is identical to all compressor units used in the complete Cantrell Compressor outfits. The S-101 is shipped complete, as shown, at $348.00 F.O.B. Plant, ready for installation with your motor and air receiver. It carries the same, low cost, factory rebuilt exchange plan as all other Cantrell compressor outfits. Among these are machines to serve every coal mine demand . . . the "S-P", self-propelling compressor and 2-ton locomotive combined—two machines in one . . . the "C-1", rubber tired for trackless mines . . . the "S-L", stationary type or for mounting in mine car.

Make Imperial-Cantrell your source of supply for complete compressor equipment and service. You'll find it pays. Remember, our compressor is our main "dish"!

For immediate details on the S-101, wire, or phone Jellico, Tenn., 292.

Cantrell
COMPRESSORS

IMPERIAL-CANTRELL MFG. CO., **JELLICO, TENNESSEE**

Jeffrey GENUIN

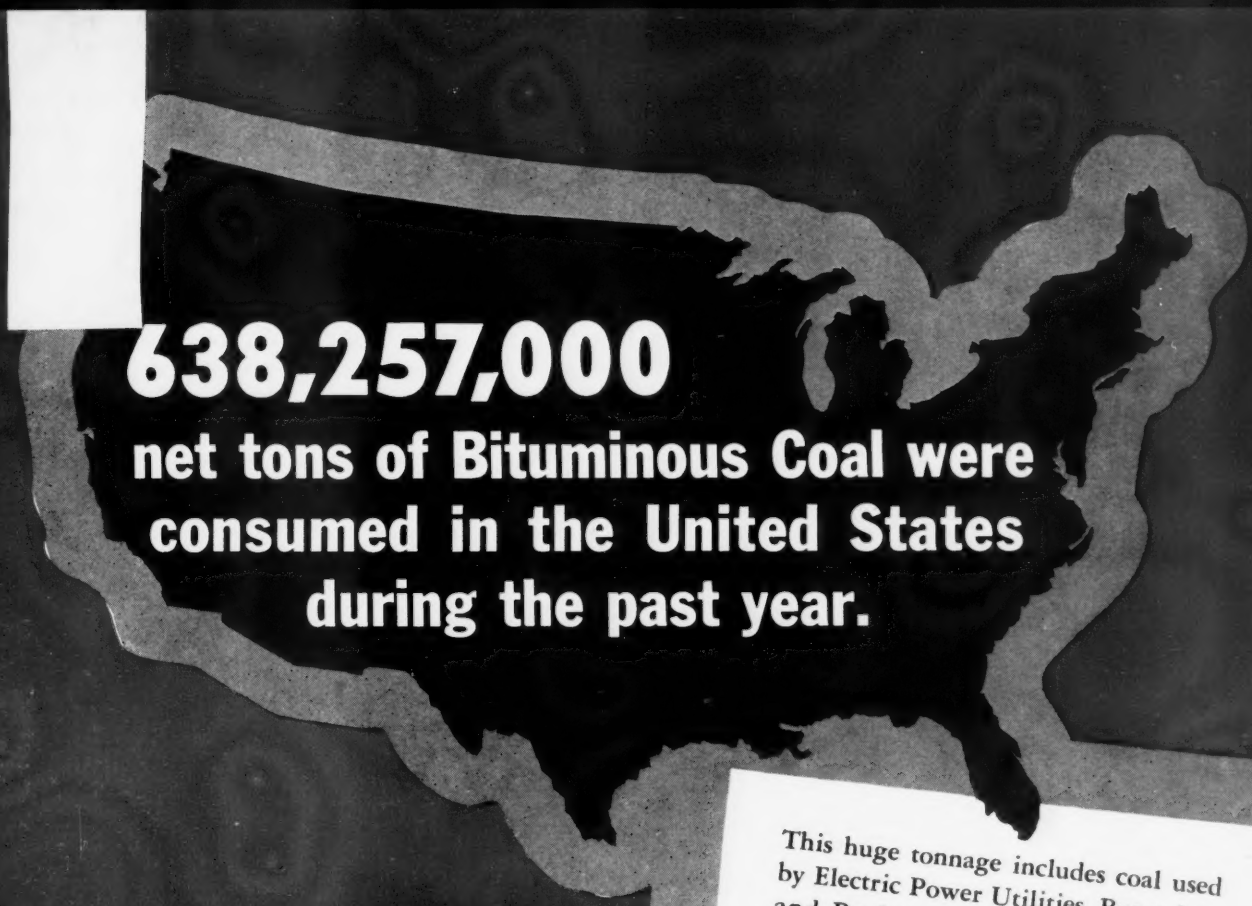
FOR LONGER, BETTER SERVICE AND PERFECT FIT

GENUINE RENEWAL PARTS

Genuine Jeffrey renewal parts offer many plus values as a result of . . . DISCRIMINATING SELECTION OF MATERIAL . . . PROPER HEAT TREATMENT . . . PRECISION MANUFACTURE . . . CAREFUL INSPECTION . . . to insure proper fit. These points are your guarantee of quality parts backed by experience accumulated through sixty odd years in the manufacture of mining machinery and parts.

360

18748

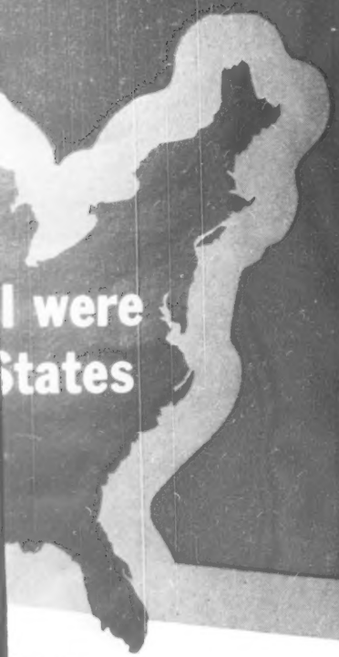


638,257,000

net tons of Bituminous Coal were consumed in the United States during the past year.

This huge tonnage includes coal used by Electric Power Utilities, Byproduct and Beehive Coke Ovens, Steel and Rolling Mills, Coal Gas Retorts, Cement Mills, Industrial Plants, Railroads and Retail Coal Dealer deliveries.

JEFFREY is proud of its share of responsibility in this production. Hundreds of mines are using Jeffrey cutters, drills, loaders, locomotives, mine conveyors, and allied equipment and Jeffrey replacement parts. The Jeffrey line includes a wide range of mining machinery for operation below or above ground. Jeffrey service includes engineering help to assist you in selecting the correct equipment for your particular operating condition.



l were
States

ge tonnage includes coal used
ic Power Utilities, Byproduct
hive Coke Ovens, Steel and
Mills, Coal Gas Retorts,
Mills, Industrial Plants, Rail-
Retail Coal Dealer deliveries.

share of
of mines
omotives,
d Jeffrey
s a wide
below or
gineering
uipment

Jeffrey *Genuine* RENEWAL PARTS

JEFFREY SERVICE TO THE COAL MINES MEANS SERVICE TO ALL INDUSTRY

JEFFREY EQUIPMENT FOR COAL MINES

- BLOWERS
- CONVEYORS
- CRUSHERS
- CUTTERS
- DRILLS
- FANS
- JIGS
- LOADERS
- LOCOMOTIVES
- SCREENS

THE JEFFREY MANUFACTURING COMPANY

Established in 1877

912-99 NORTH FOURTH STREET, COLUMBUS 16, OHIO

Sales Offices: Baltimore, Birmingham, Boston, Buffalo, Chicago, Cleveland, Cincinnati, Detroit, Denver, Harlan, Houston, Huntington, Milwaukee, New York, Philadelphia, Pittsburgh, Scranton, St. Louis, Salt Lake City

Service Stations: Pittsburgh, Harlan, Ky., Birmingham, St. Louis, Logan-Beckley, W. Va., Scranton

Foreign Plants: Jeffrey Mfg. Co., Ltd., Montreal, Quebec; British Jeffrey-Diamond, Ltd., Wakefield, England; Jeffrey-Galion (Pty.) Ltd., Johannesburg, S. A.

The new Ward LaFrance civilian trucks now beginning to roll off our assembly lines offer you **plus values** in power, rugged construction, dependability and low hauling costs. You have never seen anything to match them.

THE TOUGHEST, MOST ECONOMICAL BIG TRUCKS MONEY CAN BUY...

Don't take our word . . . . . take a demonstration.

We know this because they are the civilian version of our military models which have been called on to do the toughest jobs any trucks ever were asked to perform, and proved themselves over millions of miles, in combat, all over the world.

Here's a truck that is new, better, **proved.** Forget the limitations you've become used to in the past. Think in terms of what you think a heavy truck **should** do, not what they always have done. Then give Ward LaFrance the chance to prove that it can deliver, right to your "ideal" specifications. If we have not yet appointed a dealer in your community, write our Sales Department outlining your requirements as fully as possible.

WARD LAFRANCE

TRUCK DIVISION

GREAT AMERICAN INDUSTRIES, INC.

ELMIRA, NEW YORK

FRANCHISES AVAILABLE in several top-notch localities. Especially desirable for established dealers handling leading smaller, non-competitive makes . . . For complete details of the new profit-making Ward LaFrance Dealer Plan, write our Sales Department today.

ATLAS MANASITE DETONATORS

EXTRA SAFETY at No Extra Cost

HANDLING explosives is a job that calls for every possible safety precaution. The fact that today's labor is often inexperienced makes it doubly important that workers be fully protected.

Atlas Manasite detonators provide you with an extra margin of safety, due to the use of nitro-mannite, an exclusive detonating compound which withstands much greater impact and friction. Yet, there is no sacrifice of detonating efficiency—no added expense to the blasting job.

Millions of Atlas Manasite detonators have proved their reliability in use. Get this extra added safety at no extra cost. Call the Atlas Representative—he'll gladly give you ALL the facts.

Manasite: Reg. U. S. Pat. Off.

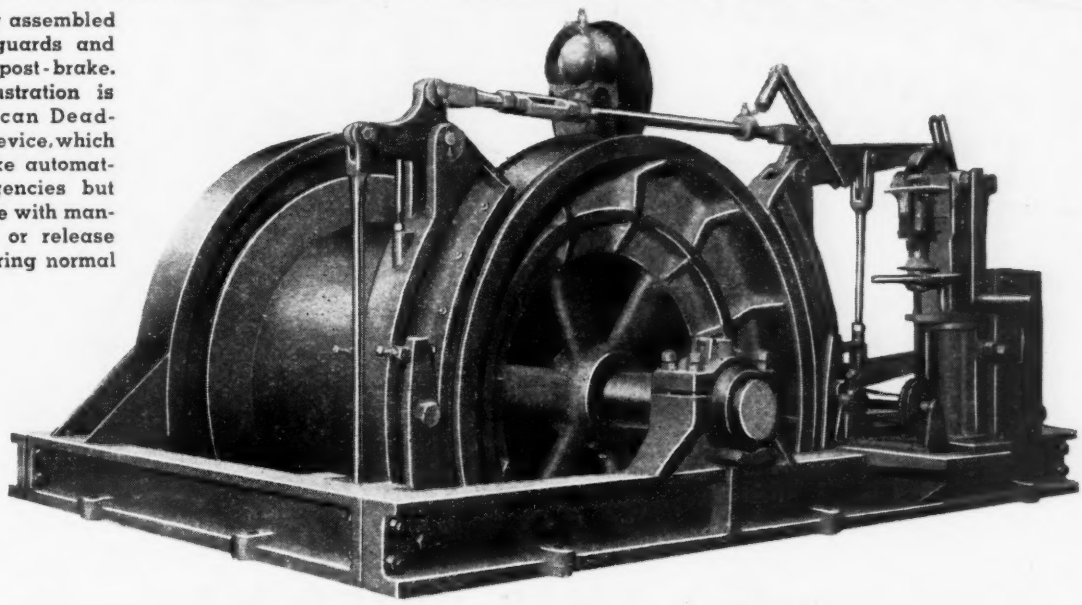
ATLAS EXPLOSIVES

"Everything for Blasting"

CHEMICALS ATLAS EXPLOSIVES

ATLAS POWDER COMPANY, Wilmington 99, Del. • *Offices in principal cities* • *Cable Address—Atpowco*

Hoist completely assembled showing gear guards and parallel-motion post-brake. At right of illustration is shown the Vulcan Dead-Weight Safety Device, which applies the brake automatically in emergencies but does not interfere with manual application or release of the brake during normal operation.

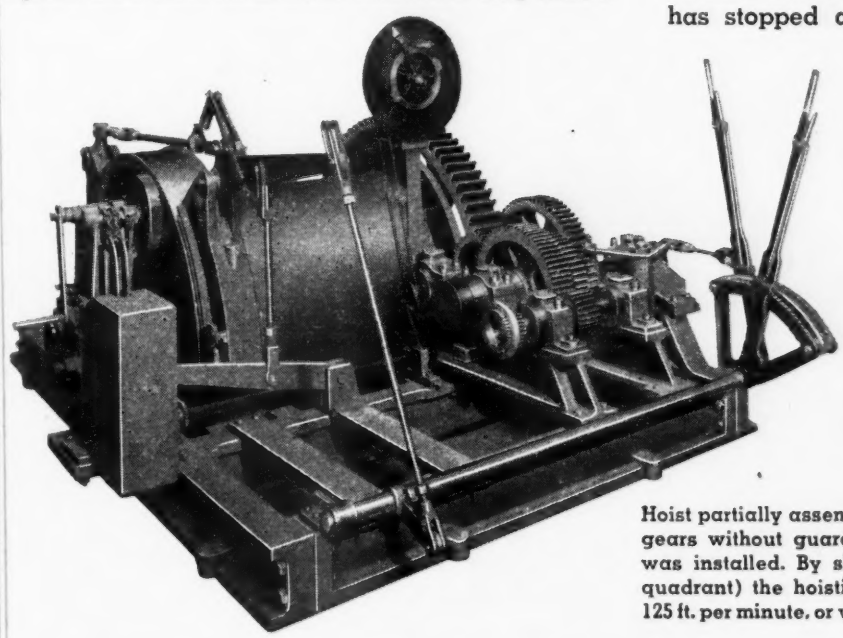


This Modern Two-Speed Slope Hoist
Solved a Two-Load Problem in a West Virginia Mine

The regular working load is not very great — approximately 12,000 lbs. on a maximum grade of 45 percent — but the hoist must also be able to pull out mine locomotives and other heavy equipment weighing as much as 26,000 lbs. To meet this condition with maximum electrical efficiency and minimum initial expense Vulcan furnished the two-speed hoist here illustrated, which not only fulfills all operating requirements but is also equipped with thoroughly-proved safety devices providing automatic protection against power-failure, over-travel and over-speeding in either high or low gear.

Safety equipment includes provision for delaying automatic application of the brake, for any reason, until the upward momentum of the load has stopped and it begins to move backward. Accumulation of slack is thereby prevented — eliminating danger of over-running the rope, or of breaking it if the load falls back rapidly enough to take up the slack with a sudden jerk.

Correspondence regarding any present or prospective requirement for money-saving specially-designed hoists is cordially invited and will receive prompt attention from our experienced engineering executives.



Hoist partially assembled showing double-reduction two-speed gears without guards and before the 65 hp. induction motor was installed. By shifting gears (with lever on right side of quadrant) the hoisting speed can be changed from 500 ft. to 125 ft. per minute, or vice versa, without changing speed of motor.

VULCAN IRON WORKS, Wilkes-Barre, Pa.

Heavy-Duty Electric Hoists
Self-Contained Hoists
Scraper Hoists
Car-Spotting Hoists
Room Hoists

Shaking-Chute Conveyors
Chain Conveyors
Cast-Steel Sheaves and Gears
Cages, Skips and Gunboats
Coal-Preparation Equipment

Steam Locomotives
Diesel Locomotives
geared and electric drive
Gasoline Locomotives
geared and electric drive

Load-Carrying Larries
Rotary Kilns, Coolers and Dryers
Crushing Rolls and Pulverizers
Briquetting Machines
Ball, Rod and Tube Mills

Tireless TIGER BRAND helps you *handle more material per day!*

Excellay Preformed

DAILY tonnage depends upon keeping equipment *actively* on the job. Time out for repairs, replacements or adjustments cuts down productiveness—cantankerous lines also lower efficiency of materials handling machines. That's why contractors and operators prefer TIGER BRAND Wire Rope.

U·S·S American TIGER BRAND Excellay Preformed Wire Rope has *Stamina* to stand up under the hardest usage encountered in grueling work of this kind. *Strength, Toughness* and *Flexibility* are reflected in the longer, trouble-free service it gives.

TIGER BRAND's high resistance to bending fatigue, its ease of handling and non-kinking, non-rotating characteristics are built-in advantages that will make your wire-rope-rigged equipment more efficient.

Prepare now for the busy days ahead. Check over your equipment. Plan to re-rig with TIGER BRAND—and *be sure to specify* TIGER BRAND Wire Rope when buying new equipment.

EVERY SUNDAY EVENING, United States Steel presents *The Theatre Guild on the Air*. American Broadcasting Company coast-to-coast network. Consult your newspaper for time and station.

AMERICAN STEEL & WIRE COMPANY
Cleveland · Chicago · New York
COLUMBIA STEEL COMPANY, *San Francisco*
United States Steel Export Company, New York
UNITED STATES STEEL

USS STEEL UNITED STATES STEEL

U·S·S AMERICAN
TIGER BRAND *Wire Rope*

"With **Gulf Quality Lubricants**

all our mechanized equipment delivers efficient, low-cost performance."—— says this Mine Foreman

(Above) Mine Foreman (second from left) shown checking the lubrication of the top hinge pin on loading machine. (Left) Section Foreman and Gulf Service Engineer checking the lubrication of shortwall cutting machine. Planned maintenance and careful attention to lubrication have paid big dividends to this mine over a period of many years.

"GULF QUALITY LUBRICANTS have contributed a great deal to the outstanding operating records of our equipment over a period of many years," says this Mine Foreman. "Proper lubrication keeps our maintenance costs very low, and makes possible greater tonnage between overhauls."

You can count on important benefits, too, when your equipment is protected with Gulf oils and greases. For these quality lubricants have superior lubricating value and longer life—two assets that insure greater production with lower costs for maintenance. And there's a type and grade for every specific requirement—with over 400 lubricants from which to select, the Gulf Service Engineer never needs to compromise in his recommendations for your equipment.

Gulf quality lubricants—and the helpful counsel of a Gulf Service Engineer—are available to you through 1200 warehouses located in 30 states from Maine to New Mexico. Write, wire, or phone your nearest Gulf office today.

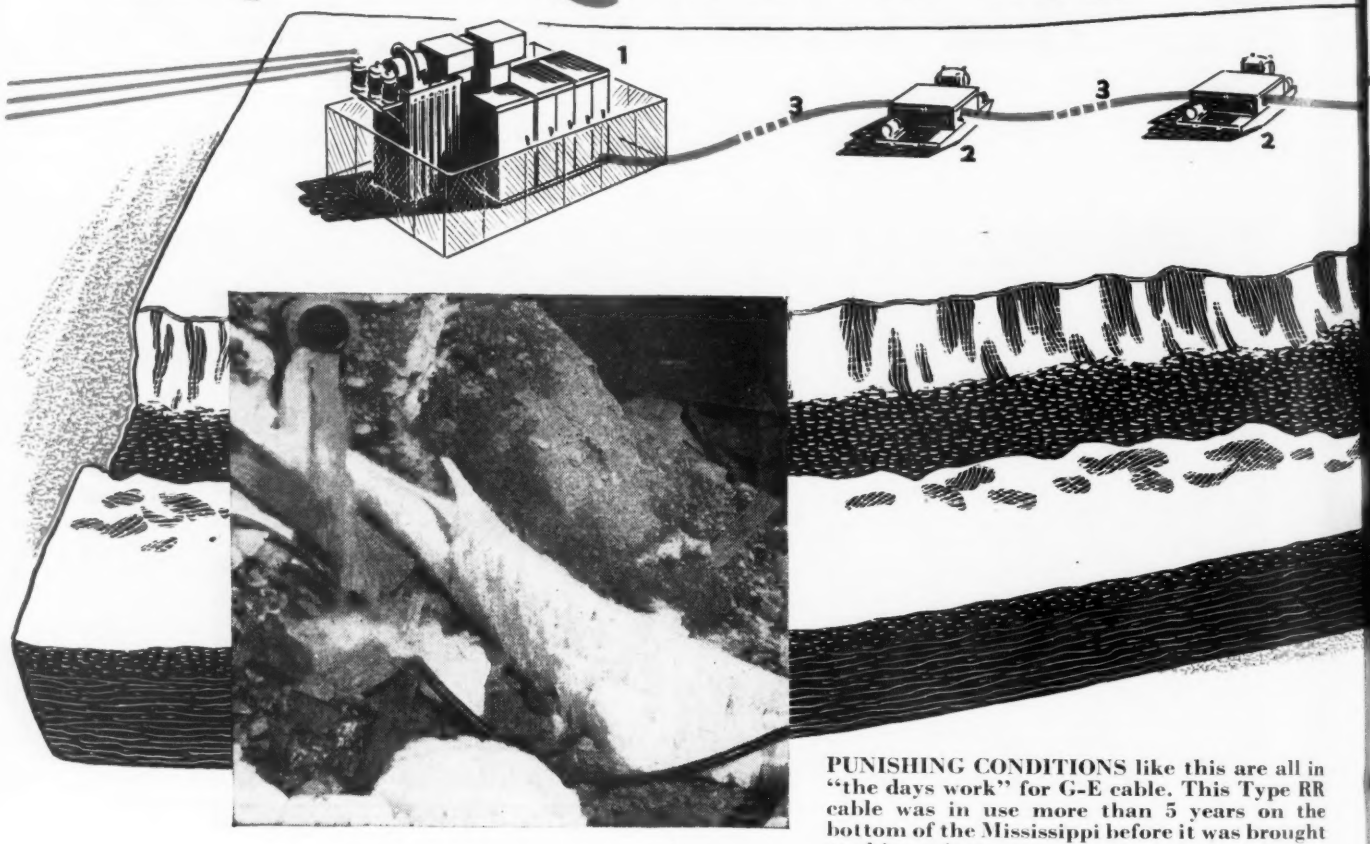
Gulf Oil Corporation · Gulf Refining Company

Division Sales Offices:

Boston • New York • Philadelphia • Pittsburgh • Atlanta
New Orleans • Houston • Louisville • Toledo

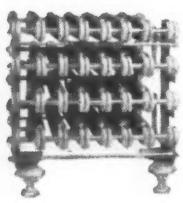
GULF INDUSTRIAL LUBRICATION

You just Roll Out the

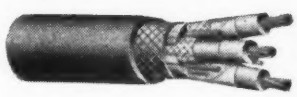


PUNISHING CONDITIONS like this are all in "the days work" for G-E cable. This Type RR cable was in use more than 5 years on the bottom of the Mississippi before it was brought to this project.

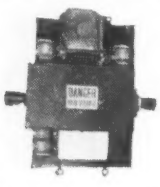
PRINCIPAL SYSTEM COMPONENTS



(1) THIS GROUNDING RESISTOR is designed to eliminate the hazard resulting from circuit grounds which may occur in shovels and other equipment. G-E application engineers will help you see to it that your entire system is safely grounded.



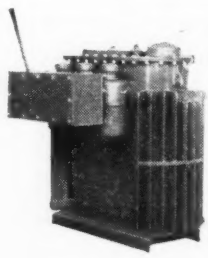
(4) PORTABLE CABLE that drags over rough terrain must be *tough.* This Type SH-D portable cable *is* tough. It is highly resistant to surface abrasion and crushing, and is difficult to kink permanently. Its flexibility makes it easy to handle—on reels or on the ground.



(2) DISTRIBUTION BOXES with manual oil switches are built to give the highest possible degree of portability and convenience. Lateral or trunk-line cables can be quickly connected or disconnected. (If desired, switch houses can also be supplied incorporating circuit breakers for overload and short-circuit protection.)

(5) CABLE COUPLING and uncoupling with this 2200-volt G-E cable plug is simple and quick. The coupler socket can be mounted on the shovel or the combination socket, and the plug can be used as a convenient means of connecting lengths of portable cable.

(3) THIS TRUNK-LINE POWER CABLE, rated 5000 volts, is ideally suited for laying on the ground. It is much lighter and more flexible than conventional leaded, armored cables. It has excellent resistance to aging, impact, and abrasion, and affords protection for personnel.



(6) COMPACT G-E PYRANOL* three-phase transformers serve dependably out-of-doors to step down voltage for operation of drills and other machines (600 volts or less). They are easily skid-mounted for rapid relocation.

*Trademark reg. U.S. Pat. Off.

POWER SYSTEM

A fully co-ordinated G-E power distribution system like this is easy to install, easy to move, and easy to extend—*and it affords a high degree of safety.*

YOU see illustrated here a power distribution system that has proved its ability to bring new speed, new flexibility, and new safety to coal-stripping operations.

In this G-E system, every component—substation, grounding resistor, cable, connection boxes, and the rest—has been carefully engineered to dovetail electrically. Because this kind of a system comes to you as a completely co-ordinated "package," you can literally roll it out and start mining. You'll find it easy, too, to extend your supply lines as operations progress farther away from the substation, or to pick up the entire system and move to a new site.

Today, G.E. is the only manufacturer that builds all the component parts—making an integrated power system that you get only when you deal with one reliable manufacturer.

Safety Features

In addition to the convenience and flexibility of placement that you get with a G.E.-engineered distribution system, you get certain definite safety features.

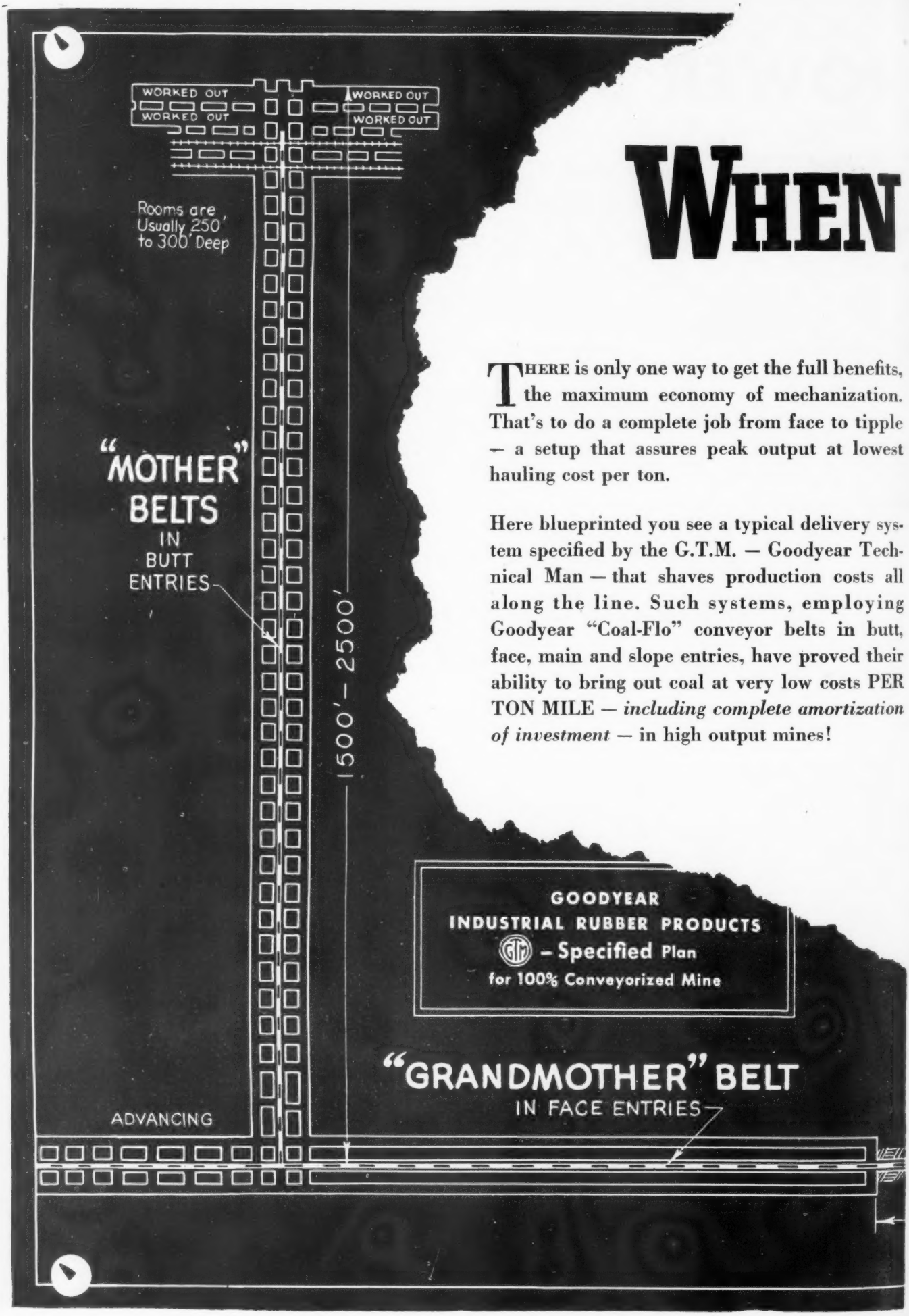
The cable is carefully grounded to safeguard the men who handle it (and to prolong cable life). Proper use of a well-designed grounding resistor practically eliminates the hazard of high-voltage shocks caused by touching equipment in which undetected shorts are occurring.

At the left is shown some of the G-E distribution equipment which makes this kind of power system practical and economical. G-E engineers who have applied this equipment in other strip mines stand ready to tell you just how such a system can fit your particular conditions. Call on them through the G-E office nearest you. *General Electric Company, Schenectady 5, N. Y.*

Buy all the BONDS you can—and keep all you buy

GENERAL ELECTRIC

657-46-148



WHEN

THERE is only one way to get the full benefits, the maximum economy of mechanization. That's to do a complete job from face to tipple — a setup that assures peak output at lowest hauling cost per ton.

Here blueprinted you see a typical delivery system specified by the G.T.M. — Goodyear Technical Man — that shaves production costs all along the line. Such systems, employing Goodyear "Coal-Flo" conveyor belts in butt, face, main and slope entries, have proved their ability to bring out coal at very low costs PER TON MILE — *including complete amortization of investment* — in high output mines!

YOU MECHANIZE –

Do it right!

The secret of this low-cost performance is the far longer life, greater over-all tonnage capacity of Goodyear "Coal-Flo" belts in mine service. They are built with acid-neutralizing compounds and mildew-inhibited carcasses to withstand the rigors of underground operation. They have correct troughing indices to insure proper training, a safeguard against misalignment and edge wear. Covers are tire-tread tough to withstand abuse and heavy loadings.

These facts explain why 95% of all the many hundreds of thousands of feet of Goodyear "Coal-Flo" belts installed in coal mines are still in use — with service life now averaging between six to eight years.

The G.T.M. is ready to show you how you can step up production with Goodyear "Coal-Flo" belts. How you can reduce fire and accident hazards. Cut timbering, brushing and grading expense. Reduce power consumption. To get the complete story, write Goodyear, Akron 16, Ohio or Los Angeles 54, California.

• • •

FOR HOSE, BELTING, PACKING, MOLDED RUBBER GOODS built to the world's highest standard of quality, phone your nearest Goodyear Industrial Rubber Products Distributor.

"Coal-Flo"—T.M. The Goodyear Tire & Rubber Company

GOODYEAR

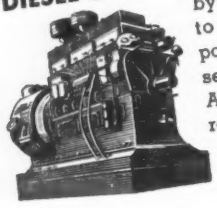
MORE TONS ARE HAULED ON GOODYEAR CONVEYOR BELTS THAN ON ANY OTHER KIND

TURN TO TYCOL "Engineered

ENGINEERED SOLUTIONS TO YOUR LUBRICATION PROBLEMS *at your fingertips*

Tycol lubricants are made in a comprehensive line to meet each specific service requirement. Their performance-proved lubricating ability is the result of modern scientific engineering and rigid testing. The line includes:

DIESEL OILS of 100% paraffine base, refined by the most modern processes to eliminate unstable compounds that would oxidize in service. There is a Tide Water Associated Oil for every Diesel requirement.



SPECIALIZED INDUSTRIAL LUBRICANTS for all types of machinery in all types of industry — from steel to textile.

GREEN CAST GREASES, made from paraffine base cylinder oil with a minimum of soap . . . extremely economical, giving greater lubrication per pound than do conventional greases.

TURBINE OILS with great stability and resistance to emulsification . . . free from sludge-forming hydrocarbons . . . engineered to inhibit Rust.

VEEDOL MOTOR OIL, refined from 100% Pennsylvania Crude by Tide Water Associated's triple-refining process, which produces that tough "film of protection" — famous all over the world.

CYLINDER OILS refined from 100% Pennsylvania Crude. They have exceptionally high resistance to breakdown under high temperature operation.

Any Tide Water Associate office will help you select the oil or grease best suited to your needs.

Drums! Drums! Drums!

War needs make it imperative that all empty drums be returned immediately.

INDUSTRIAL TYCOL OILS · GREASES

TYCOL INDUSTRIAL

ENGINEERED FOR EVERY

Lubrication"

FOR GREATER SERVICE...LONGER LIFE

from *everything* that *TURNS!*

All equipment will last longer – give better service – if the proper lubricant is used. That's why you will find it profitable to use Tycol oils and greases.

There's a reason! No matter what your lubricating need – extreme pressure*, high or low temperature, high speed, or any other service condition – there's a Tycol Oil or Grease scientifically engineered exactly to suit your specific requirements.

Refined from the highest grade crudes, Tycol lubricants are exceptionally resistant to breakdown which means greater economy . . . longer machine life for every type of equipment.

Tide Water Associated engineers will gladly recommend the Tycol lubricant that meets your particular requirements. Call, write or wire your nearest Tide Water Associated office today.

Makers of the Famous VEEDOL Motor Oil

***EXTREME PRESSURE!** For clear, concise descriptions of the basic tests used to determine important lubricant properties – Viscosity, Pour Point, Extreme Pressure and many others – consult Tide Water Associated's informative handbook "Lubricania". For your FREE copy write: Tide Water Associated Oil Company, 17 Battery Place, New York 4, N. Y.

LUBRICANTS
SERVICE NEED

TIDE WATER ASSOCIATED OIL COMPANY
17 BATTERY PLACE · NEW YORK 4, N. Y.

PRINCIPAL OFFICES
BOSTON · PHILADELPHIA
PITTSBURGH · CHARLOTTE, N.C.

IT'S THE TONNAGE THEY DELIVER THAT COUNTS

In Mine Locomotives and Shuttle Cars Alkaline Batteries Give You These Important Advantages

- They are **durable mechanically;** grids, containers and other structural parts of the cells are of steel; the alkaline electrolyte is a preservative of steel.
- They are **foolproof electrically;** are not injured by short circuiting, reverse charging or similar accidents.
- They can be **charged rapidly;** do not require critical adjustment of charge rates; can be charged directly from mine d-c supply.
- They **withstand temperature extremes;** are free from freezing hazard; are easily ventilated for rapid cooling.
- They can **stand idle indefinitely** without injury. Merely discharge, short-circuit, and store in a clean, dry place.
- They are **simple and easy to maintain.**

Keeping maximum production of coal or ore coming out puts a premium on availability of underground haulage and tramming equipment.

Time and experience have demonstrated that the unequaled dependability of Edison alkaline batteries gives the closest approach to failure-free, uninterrupted haulage it is possible to obtain. They stay on the job and out of the repair shop . . . give longer service life than any other type of battery. In fact, alkaline batteries that have been "worn out" in locomotive or shuttle-car service, are often used for various kinds of lighter duty standby work for which their capacity is still ample, and there deliver more years of dependable service.

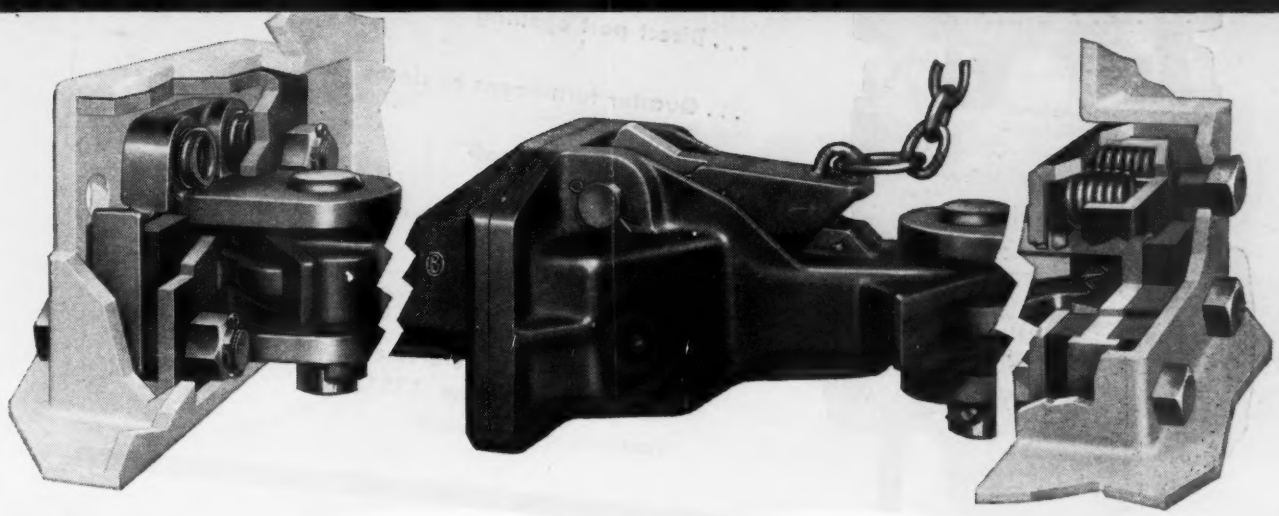
Because they give such long, trouble-free life and are so simple to maintain, alkaline batteries also help keep down haulage costs. *Edison Storage Battery Division of Thomas A. Edison, Incorporated, West Orange, N. J.*

Edison
ALKALINE BATTERIES

ANALYZE THESE THREE REASONS WHY

Rubber Replaces Steel

IN O-B'S MODERN DRAFT GEAR DESIGN



Higher Shock-Absorbing Capacity

Withstands Compression or Impact Blows Up To 50,000 lbs. As Compared to 12,000 to 15,000-lb. Limit of Ordinary Steel Springs.

Compact Trouble-Free Design

Installation Requires Minimum Space. Rubber Draft Gear Completely Enclosed Within Protective Housing.

Long Life—Maintenance-Free

No Moving Parts to Break, Wear or Corrode. Rubber Buffing Pads Eliminate Need for Troublesome Tail Studs, Follower Plates and Stop Blocks.

Ohio Brass

MANSFIELD, OHIO

CANADIAN OHIO BRASS COMPANY, LTD., NIAGARA FALLS, ONTARIO

2630-AM

For your Next Mine Car Installation, Specify . . .

O-B AUTOMATIC COUPLERS

designed specifically to meet mine operating conditions

WALWORTH LUBRICATED PLUG VALVES

offer these advantages

- . . . Direct port opening
- . . . Quarter turn opens or closes valve
- . . . Dead tight shut-off
- . . . Freedom from attack by fluids being handled
- . . . Pressure sealed
- . . . Made in a complete line. Sizes from ½" to 24" for pressures from 125 to 5,000 psi., and for vacuum requirements

THESE are just a few of the reasons why Walworth Lubricated Plug Valves give "top" performance on many *difficult* services.

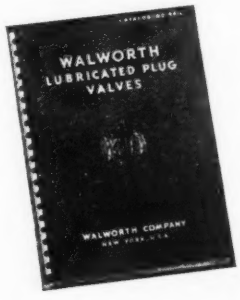
All Walworth Lubricated Plug Valves employ special insoluble lubricants which protect the plug and body against contact with the line fluid, thus combatting erosion and corrosion.

The lapped surfaces of the valve are "pressure sealed" when the valve is in either the open or closed position. By turning the lubricant screw, lubricant is forced under high pressure through a grooving system that completely encircles the parts as well as the top and bottom of the plug.

The lubricant seals the valve against leakage, and reduces friction between plug and body. This permits easy, quick, full-opening, or tight shut-off with only a quarter turn of the plug.

Fig. 1700 (illustrated) is a Steeliron valve, wrench operated, designed for a working pressure of 200 pounds WOG (water, oil, or gas). Valves are available in either screwed or flange types. Screwed type have API line pipe thread lengths. Flanged type are faced and drilled to American Standard for 125-pound cast iron flanges unless otherwise specified.

For further information about Fig. 1700, as well as the complete line of Walworth Lubricated Plug Valves write for Catalog No. 44L.



SEND FOR THIS FREE CATALOG

This new Walworth Lubricated Plug Valve Catalog No. 44L is just off the press. It gives prices, sizes, dimensions, and other pertinent data on this comprehensive line. A request on your company's letterhead will bring you a free copy of this informative catalog.

14 AWARDS TO 4 PLANTS

WALWORTH

valves and fittings

60 EAST 42nd STREET, NEW YORK 17, N. Y.

DISTRIBUTORS IN PRINCIPAL CENTERS THROUGHOUT THE WORLD

O-B Wedge Bonds Cost 9 per cent Less than Welded Bonds of Similar Length

Analyze This Cost Comparison

COST PER 100

		WELDED	WEDGE
MAT'L	100—4/0 Bonds, 32" long	112.84	140.00
	25 lbs. Welding Rod	2.25	—
LABOR*	(2-man crew installing 5 per hr.)	40.00	—
	(1-man crew installing 10 per hr.)	—	10.00
ENERGY	(200 amps at 250 volts for 6 minutes per bond at 2¢ per KWH)	10.00	—
	(2.4 amps at 250 volts for 2 minutes per bond at 2¢ per KWH)	—	0.04
TOTAL COST	Total cost installed — 100 welded bonds	165.09	—
	Total cost installed — 100 wedge bonds	—	150.04
	*Taken at $1.00 per man-hour		

MORE BONDS PER LABOR DOLLAR

O-B Wedge Bonds Can Be Installed Two to Three Times Faster Than Welded Bonds.

NO WELDING ROD REQUIRED

Only a Few Hammer Blows Needed to Apply Wedge Bond on Rail in Permanently-Tight Mechanical and Electrical Joint.

LOWER POWER COSTS

Power Consumed in Applying One Welded Bond Sufficient to Drill Rail Holes for 250 Wedge Bonds With O-B Electric Mobildrill.

2632M

Ohio Brass

MANSFIELD, OHIO

Canadian Ohio Brass Co., Ltd., Niagara Falls, Ont.

The LIFELINE of the Mine

"This cable's got everything it takes to stand rough treatment," says Romey.*

*Copr. 1945 RCC

Long life, as measured by months of trouble-free service on the toughest job in the mine, is built into every inch of Rome "60-38" Single Conductor Locomotive Gathering Cable.

The ideal Locomotive Cable with complete adhesion between copper conductor and the insulation. It is protected overall with a tough Neoprene jacket. This cable is recommended for electric locomotives of the gathering reel type or any other service requiring a flexible, heavy duty portable cable, where extreme adhesion of the insulation to the conductor is desired.

THE CONDUCTOR is composed of rope stranded, tinned copper wires. The individual ropes are laid up in a special manner to resist both tension and torsion.

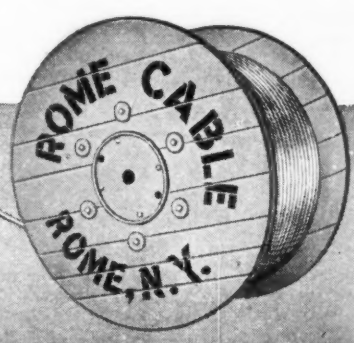
A SPECIAL INSULATION is used, which has high electrical qualities and extreme adhesion to copper conductor, which prevents separation of the conductor from the jacket.

HEAVY TWINE REINFORCEMENT CORDS are applied over insulation to strengthen the cable and control adhesion between insulation and jacket.

THE NEOPRENE JACKET is vulcanized in continuous lead molds and has a high tensile strength, maximum resistance to tearing and abrasion, and long aging characteristics.

FROM BAR TO FINISHED WIRE

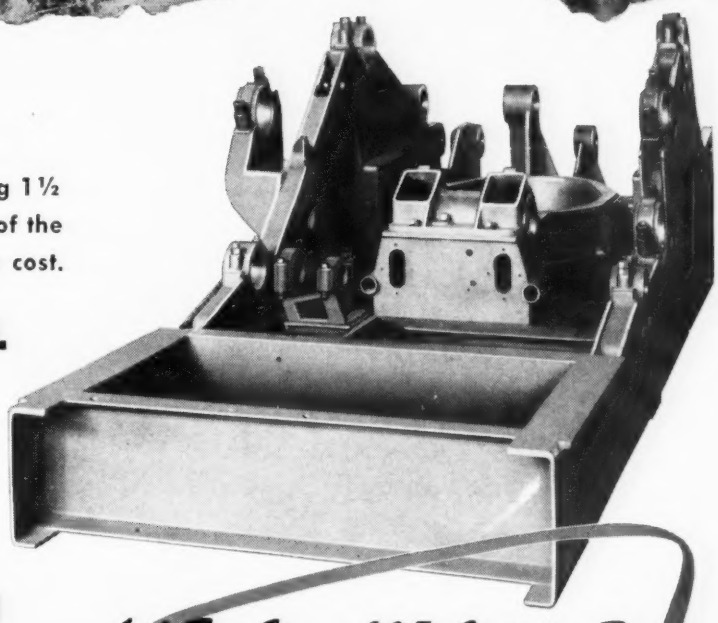
ROME CABLE
CORPORATION
ROME • NEW YORK



ONE-PIECE TURNTABLE

KEEPS MACHINERY ALIGNED

KOEHRING **605**



ONE WELDED UNIT

Machinery stays aligned on the new Koehring 1½ yard shovel. Precise alignment prolongs life of the machine, prevents undue wear, cuts upkeep cost.

SIDESTANDS ARE INTEGRAL

Sidestands supporting the horizontal shafting on the new Koehring 605 are integral parts of the massive turntable, securely welded on, permanently joined to keep shafting in lasting alignment.

GEAR HOUSING WELDED IN

Because a separate, bolted-on housing might work loose to throw vertical shafting out of line, the bevel swing and traction gear case on the new Koehring 605 is welded directly into the turntable. No bolts used to join housing and turntable.

Ask For Your 605 Catalog Today

KOEHRING COMPANY
MILWAUKEE 10
WISCONSIN

KOEHRING HEAVY DUTY

HEAVY-DUTY CONSTRUCTION EQUIPMENT

Competitors' Pastures
look mighty green these days . . .

Today, when the world needs coal, mining executives who view competitors' modern preparation plants get inspiration and practical ideas for turning their own coal into a better burning fuel and substantially increasing the output for both domestic and foreign consumption.

Coal properties, sometimes unpromising, invariably have been transformed by the preparation plant into prosperous enterprises . . . output increased . . . product elevated to the premium price class.

Laboratory tests forecast whether your coal, even though it is of varying degrees of impurity, can be transformed into coal to meet exacting grade specifications. These tests are the result of research and analyses in the McNally Pittsburg laboratories.

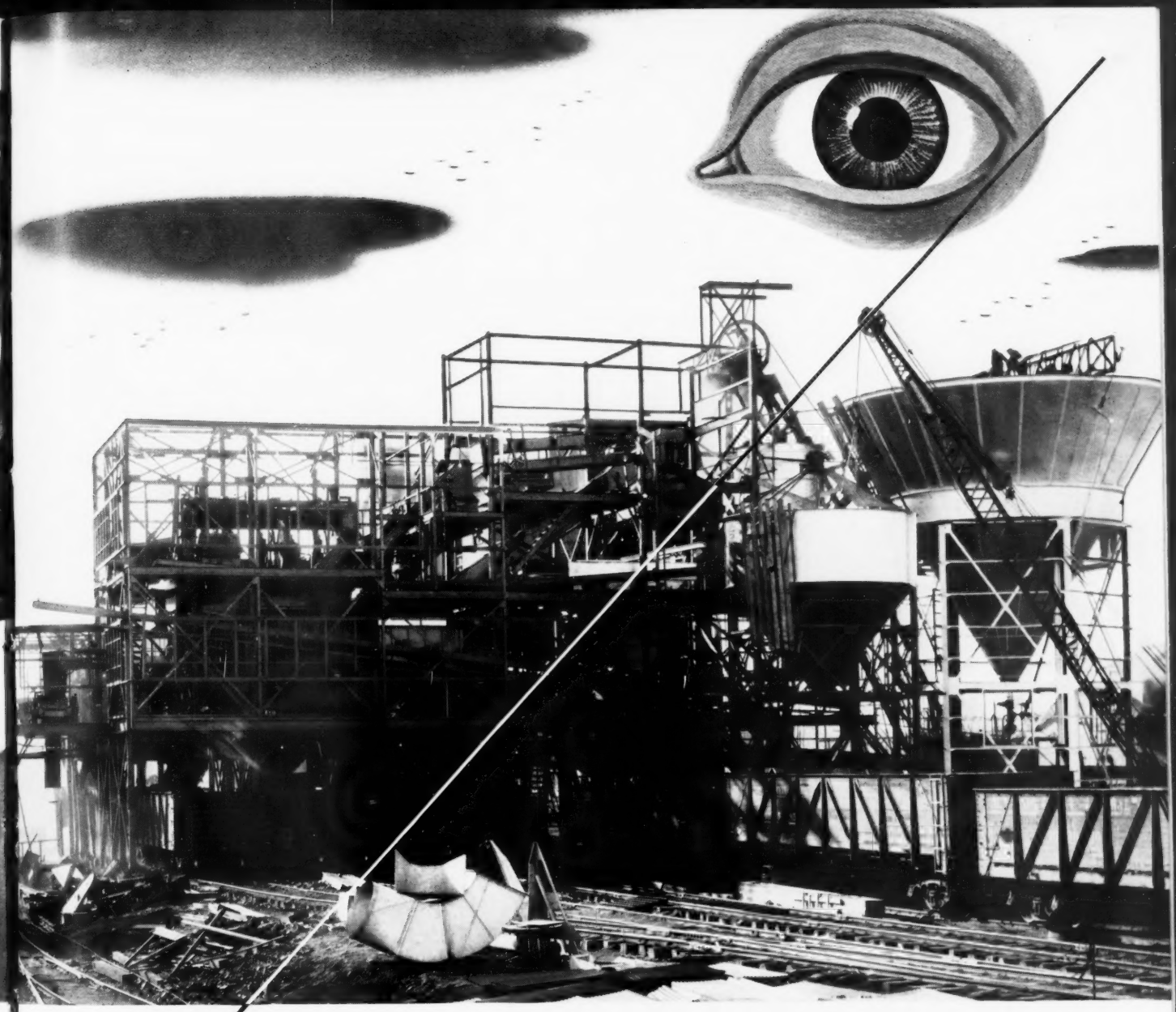
In every bituminous area there is a chain of McNally Pittsburg coal preparation plants. Some are small plants, producing only a few hundred tons per hour . . . some are large, producing 1000 tons per hour or more. Regardless of size, every plant performs efficiently at a cost for preparation of only a few cents per ton . . . furnishing the consumer with the specification fuel he needs and which he will continue to buy. We are greatly interested in designing and building plants of all sizes, from the largest to the very smallest.

(Reproduction of advertisement substantially as it appears in Fortune Magazine)

McNALLY PITTSBURG

MANUFACTURERS OF EQUIPMENT TO MAKE COAL A BETTER FUEL

McNally Pittsburg Manufacturing Corporation, Pittsburg, Kans. • Chicago 1, Ill. • Pittsburgh 19, Pa. • Caixa Postal 1310, Rio de Janeiro, Brazil



Turn Your Gaze Our Way

and your own plant will start to appear

Your executives and production officials are invited to consult with our technical staff. They will go over your properties. Your raw coal will be analyzed. Your customers' needs and specifications will be reviewed.

Sketches will then appear on paper. Further discussions with your executives and production officials will reveal what your raw coal input will yield in various classifications and the size and type plant required to produce these fuels.

Plant and equipment will then be laid out to accomplish these objectives with abundant over-capacity to accommodate the growing demand for your product which you will inevitably experience once your plant is in operation and ready to ship coal.

Before long, concrete foundations will rise. When erection is completed, test runs will be made. Finally your new plant will be delivered to you as a successful operating unit to be supervised by our engineers until all of your men are fully familiar with an automatic plant that takes in raw coal at the top and delivers specification fuels into waiting cars.

You give the green light, and our technical staff will come to your office to consult with a group of your production executives and operating men. This preliminary discussion will not obligate you in the slightest.

McNALLY PITTSBURG

MANUFACTURERS OF EQUIPMENT TO MAKE COAL A BETTER FUEL

McNally Pittsburg Manufacturing Corporation, Pittsburg, Kans. • Chicago 1, Ill. • Pittsburgh 19, Pa. • Caixa Postal 1310, Rio de Janeiro, Brazil

For FASTER *Utility Rock Drilling*

Thor NO. 38 LIGHT WEIGHT SINKER

POWERFUL blows, dependable rotation and efficient hole cleaning make the Thor No. 38 Sinker the ideal drill for taking up bottom, brushing roof and general maintenance rock jobs. Just 11 pounds in weight, it is perfectly balanced for easy, one-man operation. The exclusive Thor short-travel, tubular valve uses, effectively, *all* the air that enters the tool. It provides *extra* power with extremely low air consumption. Fully cushioned piston action, automatic lubrication and enclosed retainer springs result in long-life and low maintenance.

INDEPENDENT PNEUMATIC TOOL COMPANY
600 W. Jackson Boulevard, Chicago 6, Illinois
Birmingham Boston Buffalo Cleveland Detroit Los Angeles Milwaukee New York Philadelphia
Pittsburgh St. Louis Salt Lake City San Francisco Toronto, Canada London, England

Thor PORTABLE POWER TOOLS

PNEUMATIC TOOLS • UNIVERSAL AND HIGH FREQUENCY ELECTRIC TOOLS • MINING AND CONTRACTORS TOOLS

BECAUSE any belt conveyor system consists primarily of two main units—a BELT to carry the load, and a MECHANISM to move the belt—the engineering of these two vital units requires the closest kind of cooperation between equipment designer and belt manufacturer.

That is the kind of cooperation that produces the best results for *you*. Therefore, it is only natural that HEWITT, a name backed by 85 years in producing quality rubber products . . . and ROBINS, a name pre-eminent in the field of materials handling machinery for 49 years . . . should combine their 134 years of industrial experience. By combining their efforts . . . pooling their research . . . merging their resources and distribution facilities, they can offer you the *only complete job-engineered materials handling service in America.*

from HEWITT — quality rubber products for industry for 85 years. Precision-built, JOB-ENGINEERED conveyor *belts* for half a century.

from ROBINS — the finest JOB-ENGINEERED materials handling *machinery* for 49 years.

* * *

now, from HEWITT and ROBINS the only complete JOB-ENGINEERED *materials handling service in America.*

HEWITT RUBBER *of Buffalo*

HEWITT RUBBER CORPORATION, Buffalo, N. Y.

ROBINS CONVEYORS INCORPORATED, Passaic, N. J.

11-B...the

These Features Cut Costs, Increase Tonnage:

1. Cuttings delivered at rear of machine.
2. Exclusive lever-controlled rope drums for instantaneous operation of drum frictions.
3. "Free Wheeling" rope drums save time in setting jacks and positioning machine.
4. Anti-friction bearings on all load bearing gears and shafts.
5. All gearing and driving mechanisms run in a bath of oil within a dust- and oil-tight housing.
6. "Lift In, Drop Out" type cutter chain clutch—cannot become accidentally engaged.
7. Retarding brake to frame of machine.
8. Underwinding feed rope for longer rope life and safer operation.
9. Reversing, pilot-operated contractor control.
10. Electrical overload protection.
11. One-speed reduction from motor pinion to cutter chain drive sprocket. Fewer and larger gears—less maintenance.

Fewer controls — four-step motor control.
A. C. or D. C. motor — open type or "Government approved"— 35 or 50 H. P.
Cutter bars available — 5½, 6½ or 7½ ft. length.
Will cut 4, 5 or 6 inch kerf.

SULL

a world-wide organization...

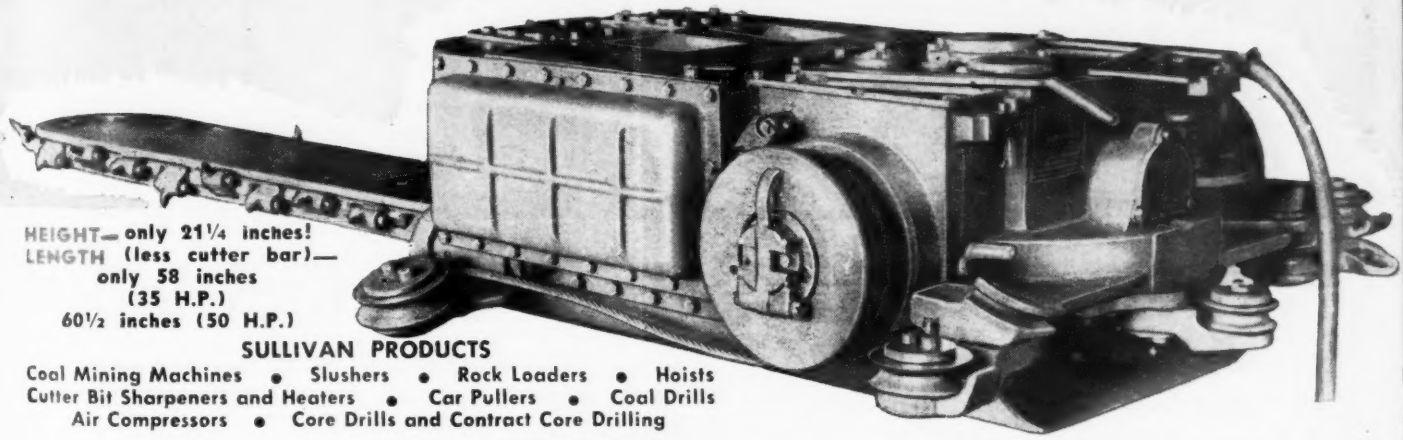
Shortwall...
for conveyor mining!

The Lowest Shortwall in Its Power Range That Discharges Cuttings to the Rear

Extremely low height and short length, together with safety and ease of operation, make the Sullivan 11-B Shortwall Coal Cutter an outstanding machine for conveyor mining. With many features proved in service during the past four years, the 11-B is available in two sizes (35 and 50 H. P.) to best meet all requirements. It's the answer to modern mining needs! Call in the nearest Sullivan engineer and ask for complete information.

Sullivan manufactures coal cutters for *every* system of mining, including the NEW Universal rubber-tired 10-RU, *the only machine of its kind designed exclusively for trackless mining.* Ask for literature.

Sullivan Machinery Company, Executive Offices: Michigan City, Indiana. In Canada: Canadian Sullivan Machinery Co., Ltd., Dundas, Ontario.



HEIGHT—only 21¼ inches!
LENGTH (less cutter bar)—
only 58 inches
(35 H.P.)
60½ inches (50 H.P.)

SULLIVAN PRODUCTS

Coal Mining Machines • Slushers • Rock Loaders • Hoists
Cutter Bit Sharpeners and Heaters • Car Pullers • Coal Drills
Air Compressors • Core Drills and Contract Core Drilling

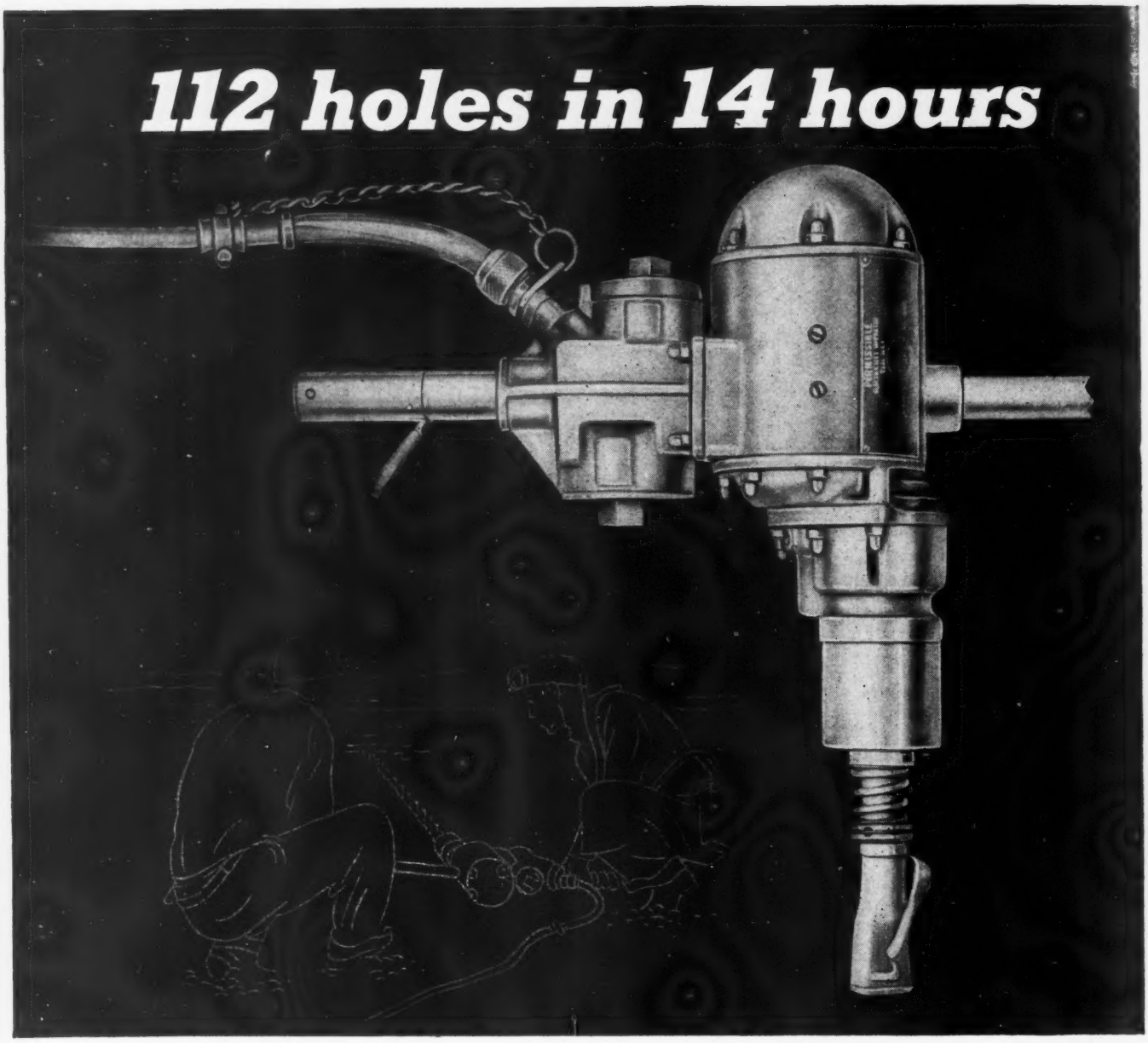
BRANCH OFFICES

Birmingham, Ala.
Butte, Mont.
Chicago, Ill.
Dallas, Texas
Denver, Colo.
El Paso, Texas
Huntington, W. Va.
Knoxville, Tenn.
Middlesboro, Ky.
New York, N. Y.
Philadelphia, Pa.
Pittsburgh, Pa.
Seattle, Wash.
San Francisco, Calif.
Salt Lake City, Utah
Scranton, Pa.
St. Louis, Mo.

SULLIVAN

...established 1851

112 holes in 14 hours



CP No. 572 Permissible Hand-Held Coal Drills

CP No. 572 Permissible Electric Coal Drills with Safety Clutch, in the difficult drilling Alma seam, are performing regularly at the rate of 112 holes, 2¼″ diameter by 7 feet deep, for each day of two seven-hour shifts. Drilling time ranges from 1 minute, 10 seconds, to a maximum of 1 minute, 30 seconds, per hole.

CP design features include unusual accessibility for examination of parts, light weight, and a safety clutch for release in case an auger sticks — a valuable protective feature for the operators and motor. Write for Catalog 902.

CP offers the largest line of Hand-Held and Post-Mounted electric coal drills: five sizes of the Hand-Held type; and four sizes of the Post-Mounted type.

★★★★★★★★
PNEUMATIC TOOLS
ELECTRIC TOOLS
HYDRAULIC TOOLS
ROCK DRILLS

CHICAGO PNEUMATIC
TOOL CP COMPANY
General Offices: 8 East 44th Street, New York 17, N. Y.

★★★★★★★★
AIR COMPRESSORS
VACUUM PUMPS
DIESEL ENGINES
AVIATION ACCESSORIES

The IMPRINT of the Tire that PAYS OFF... the Firestone ROCK GRIP

YES, there is a tire that pays off — it's the Firestone Rock Grip. It pays off because it reduces operating costs — puts more money on the profit side of the ledger.

Look at that Rock Grip tread. It takes hold and out-pulls any other off-the-highway tire made. Tough? It has plenty to spare for the toughest job. And like other Firestone Off-the-Highway tires, the Rock Grip body can be retreaded many times. That is the kind of a tire that saves you money.

The next time you buy Off-the-Highway tires, make them Firestone tires. Then let your records show you how your tire operating costs go down.

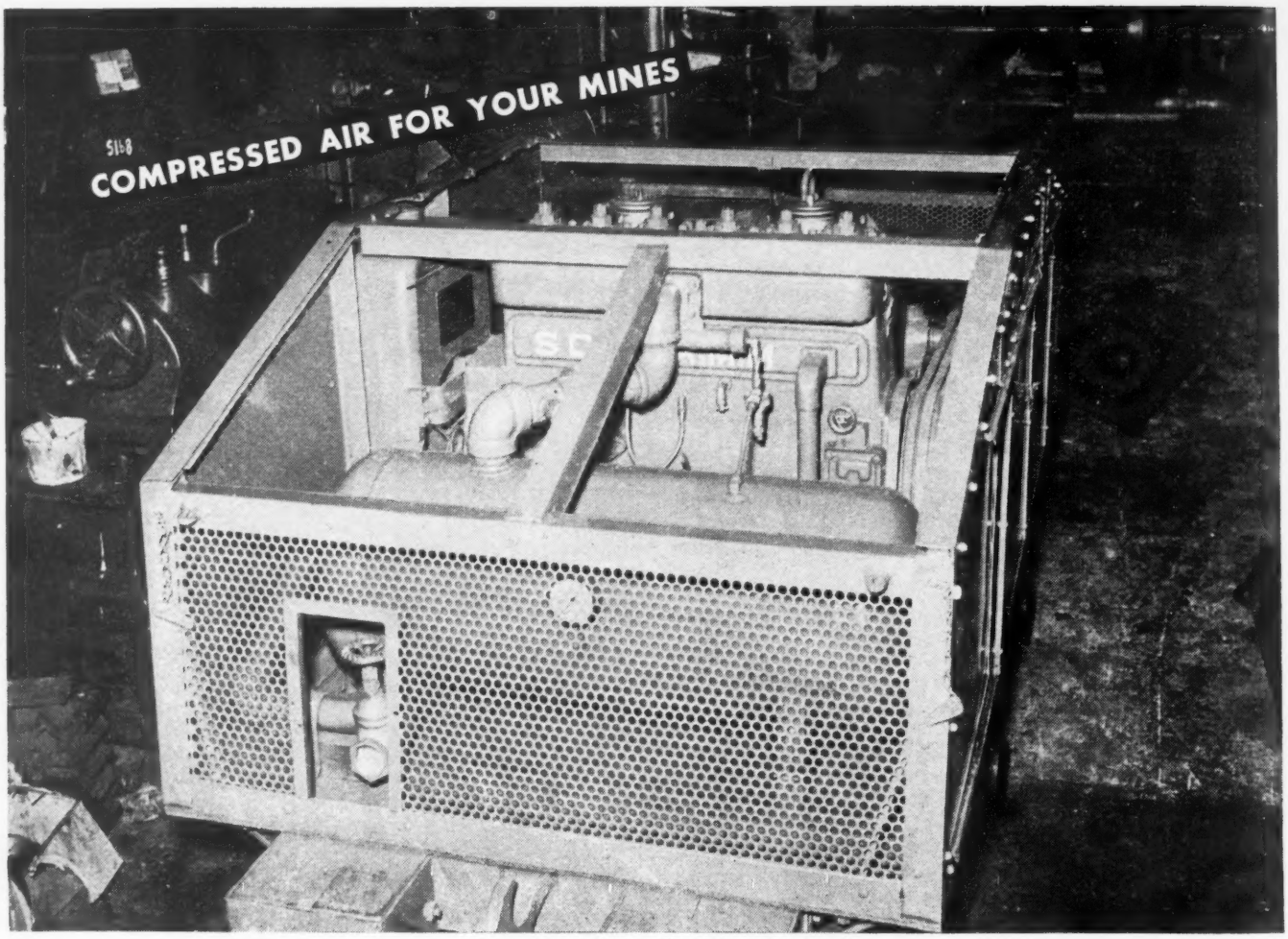
For the best in music, listen to the "Voice of Firestone" every Monday evening over NBC network.

Copyright, 1945, The Firestone Tire & Rubber Co.

A.N.S. EARTH MOVER — ROCK GRIP — GROUND GRIP

Firestone

OFF-THE-HIGHWAY TIRES



SCHRAMM OFFERS THESE *Exclusive* COMPRESSOR-ECONOMY FEATURES

Four features make Schramm Air Compressors ideal for *any* compressed air job in your mine . . . (1) 100% water cooled; (2) Compact—lightweight; (3) Mechanical intake valve; (4) Forced feed lubrication. These features enable you to do your compressed air jobs quickly—easily—economically!

Schramm Compressors are designed for heavy duty, continuous service, with minimum attention. They are built in sizes ranging from 20 to 600 cu. ft. displacement, in every type of mounting and assembly.

Illustrated is a Schramm mounted in a mine car . . . to go right into the mine. Stationary and portable compressors of all sizes are available. The future of mining is great. Make your mining *easier* by using Schramm Air Compressors. Write today for construction details of these compact, sturdy units.

This Stands for Honorable Service for Our Country

SCHRAMM INC. THE COMPRESSOR PEOPLE WEST CHESTER PENNSYLVANIA

THE ANSWER to Labor Shortage is MORE MECHANIZATION!

IN 1944—with approximately 40,000 less men than it employed in 1940—the coal industry had increased production by more than 150 million tons. Some highly mechanized mines increased their output by as much as 30%.

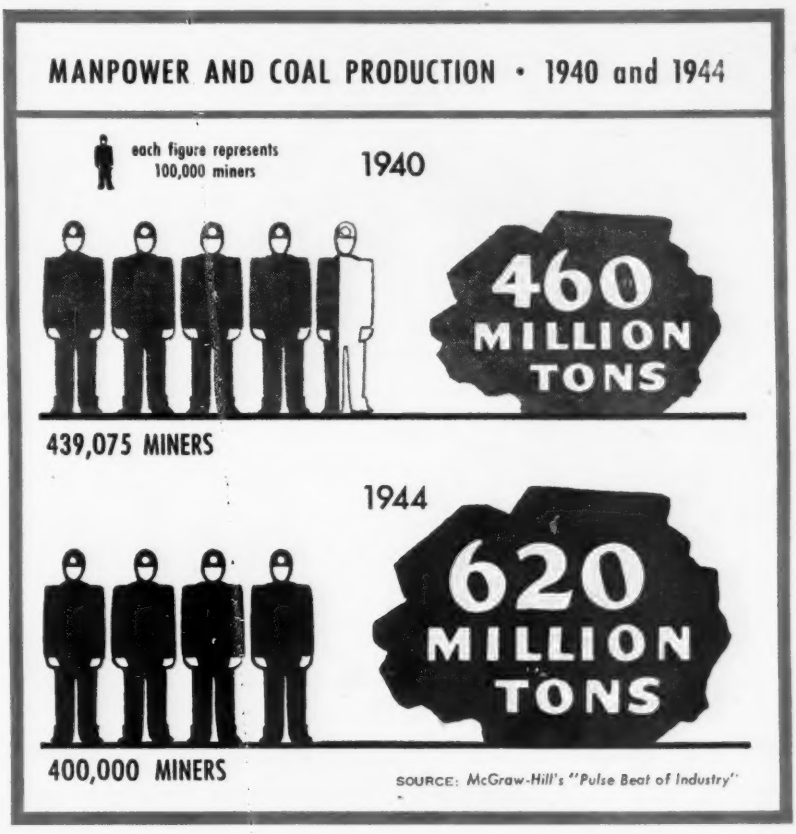
Mechanization not only maintains production and lowers costs, but—mechanization *above ground* produces the *clean* coals of low impurity content, correct sizing and uniformity that win the better markets—the higher prices.

Morrow Tipples *streamline production* from the mine, through modern preparation equipment, to cars and barges in shorter time, at lower costs—in best condition to SELL!

That's why a high percentage of all mechanized mines are Morrow equipped.

* * *

Morrow engineers are available now and ready to work with you. Ask Morrow to assign an engineer to study your situation. Write The Morrow Manufacturing Company, 1948 Ford Blvd., Wellston, Ohio. Division The Wacker Corporation.



Better Preparation
= *INCREASED SALES!*

1. low impurity content
2. correct sizing
3. high uniformity

MECHANIZE WITH MORROW

COAL WASHERS • WEIGH PANS • FEEDERS • DUMPS
BINS AND BIN GATES • FLANGED LIP SCREENS
CONVEYORS • LOADING BOOMS • SHAKING SCREENS
VIBRATING SCREENS • CAR HAULS • PICKING TABLES
SETTLING TANKS • ELEVATORS • CAR RETARDERS
PERFORATED METAL SCREENS • STEEL STRUCTURES

MARION
ACCEPTS THE CHALLENGE!

MARION engineers accept the challenge of deeper overburden with the new 40 cu. yd. coal stripping shovels and large walking draglines. Backed by years of experience, they are prepared to work hand in hand with a Coal Stripping Industry determined on digging still deeper coal at a profit.

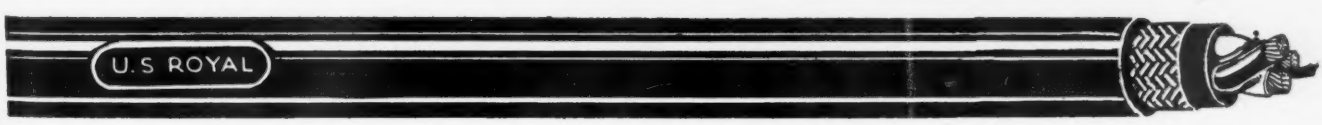
What are your coal stripping problems? May we discuss them with you?

40
Cubic Yards

Many 35 cu. yd. MARION Coal Strippers are in use. 40 cu. yd. machines are now in production.

THE MARION STEAM SHOVEL COMPANY
Marion, Ohio
COAL STRIPPERS COAL LOADERS
3/4 cu. yd. to 40 cu. yds.
Offices and Warehouses in Principal Cities

STRETCHEROO



S-t-r-e-t-c-h . . . S-t-r-a-i-n . . .

That's one of the torturing tests that U. S. Royal Cords and Cables must survive in our laboratories. While undergoing relentless stretching, lengths are scientifically examined and tested at each successive stage.

The purpose? Well, because U. S. Royal Cords and Cables are subjected to punishing tests of stretch, heat, cold, impact, immersion and compression you are assured they are Safety-Tested. They're the cords and cables to meet *all* the demands of your toughest jobs.

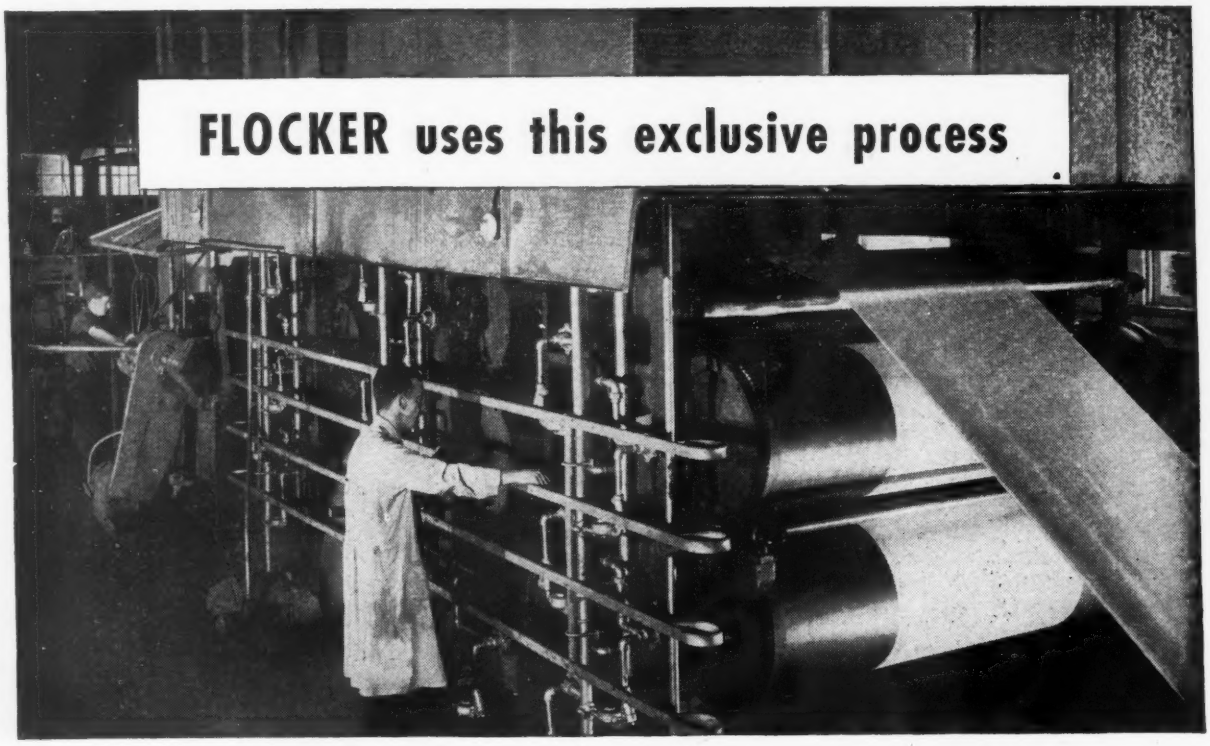
THE NEW U. S. ROYAL *Safety Tested*

MINING MACHINE AND LOCOMOTIVE CABLES

UNITED STATES RUBBER COMPANY

1230 SIXTH AVENUE • ROCKEFELLER CENTER • NEW YORK 20, N. Y.

SERVING THROUGH SCIENCE WITH ELECTRICAL CORDS AND CABLES



. . . to give you *better brattice cloth*

Flocker Moropa Brattice Cloth offers greater resistance to fire and mildew . . . stays clean longer and, under identical conditions, outwears the ordinary product.

This all-around superiority is achieved through an exclusive chemical process applied to either Jute or Cotton. The fabric is first saturated with special chemicals, then "can-dried"—a process adapted from the textile field—which thoroughly impregnates and bakes fire and mildew resisting properties into every fiber of the material.

And yet, in spite of its superior qualities, Flocker Moropa Jute Brattice Cloth costs you no more than ordinary Brattice Cloth . . . and prices are only slightly higher on Cotton. In reality, substantial savings can be realized on the use of either type.

If you're interested in the advantages this better Brattice Cloth affords, write for detailed information and quotations.

PROVED SUPERIORITY IN COTTON OR JUTE!

SUPERIOR FIRE-RESISTANCE—Protection lasts almost indefinitely, since chemicals are so thoroughly impregnated that they do not readily leach out.

SUPERIOR MILDEW REPELLENCE—Chemicals used do not absorb excessive moisture and fabric remains relatively dry and repellent to mildew.

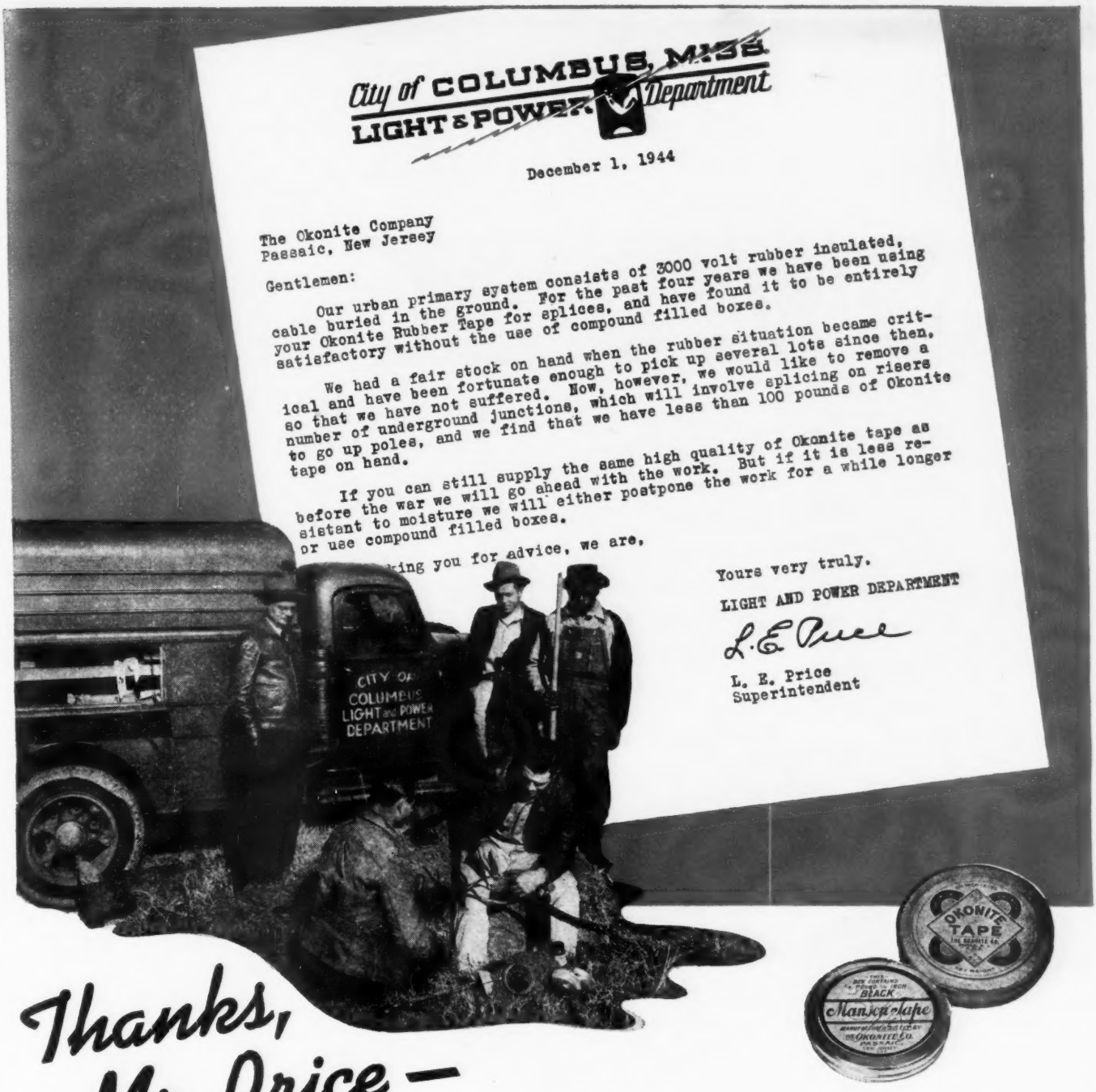
STAYS CLEAN—Does not collect mildew "whiskers"—hence no slimy dirt.

LONGER SERVICE—Can be used and re-used over and over again. Absence of slime eliminates objections to recovery—men will co-operate in maintaining this Brattice Cloth which so vastly improves their working conditions.

JOHN FLOCKER AND COMPANY

644 GRANT STREET, PITTSBURGH 30, PA.

Since 1822, Ropes, Slings, Nets and Cordage Fittings, Tackles, Waxed and Unwaxed Linen . . . Specialists in Cordage Problems . . . Wire Rope


City of COLUMBUS, MISS.
LIGHT & POWER Department
December 1, 1944
The Okonite Company
Passaic, New Jersey
Gentlemen:
Our urban primary system consists of 3000 volt rubber insulated, cable buried in the ground. For the past four years we have been using your Okonite Rubber Tape for splices, and have found it to be entirely satisfactory without the use of compound filled boxes.
We had a fair stock on hand when the rubber situation became critical and have been fortunate enough to pick up several lots since then, so that we have not suffered. Now, however, we would like to remove a number of underground junctions, which will involve splicing on risers to go up poles, and we find that we have less than 100 pounds of Okonite tape on hand.
If you can still supply the same high quality of Okonite tape as before the war we will go ahead with the work. But if it is less resistant to moisture we will either postpone the work for a while longer or use compound filled boxes.
ing you for advice, we are,
Yours very truly,
LIGHT AND POWER DEPARTMENT
L. E. Price
Superintendent
CITY OF COLUMBUS LIGHT and POWER DEPARTMENT
OKONITE TAPE
BLACK
Manson Tape
OKONITE CO.

Thanks, Mr. Price —

We at Okonite like to get letters that tell us about good jobs done by our products. Naturally that goes for tapes as well as cables. And — also naturally — we like to get orders. Remain assured that in Okonite and Manson tapes we have consistently refused to use substitutes, and any such tapes you obtain are "the same high quality . . . as before the war."

But we haven't been able to fill all our orders for Okonite and Manson tape because of government restrictions on critical rubber. When Okonite and Manson tapes are again available to all, there will have been no let-down in what they have always offered utilities, railroads, and other industry. Long service life, for example, moisture resistance . . . better splicing . . . toughness and weathering qualities . . . in short, what it takes to give a joint the best insulation and mechanical protection that money can buy.

• When unable to obtain Okonite and Manson tapes, many of our customers are obtaining satisfactory results from our Dundee tapes or our Hazard Division's Panther and Dragon Tapes. The Okonite Company, Passaic, New Jersey.

OKONITE and MANSON TAPES
wherever electrical splices are needed

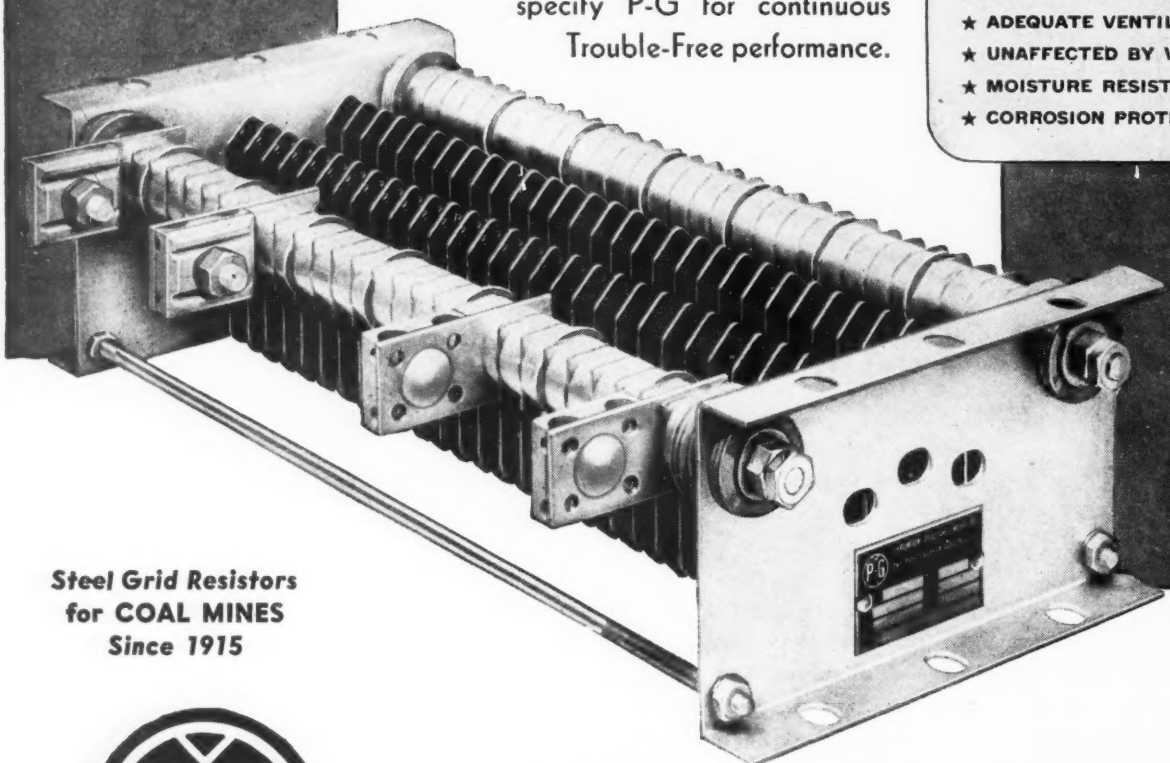
Dependable Performance

always with

P-G *Steel Grid Resistors*

In mines widespread acceptance of P-G Steel Grid Resistors is the direct result of outstanding records for constant dependable performance. Service records are created by use of durable materials in unique and exclusive design to produce resistors able to easily meet the most exacting requirements. Always specify P-G for continuous Trouble-Free performance.

- ★ ALL STEEL CONSTRUCTION
- ★ MICA INSULATION
- ★ RUGGED TERMINALS
- ★ PROVISION FOR EXPANSION
- ★ ADEQUATE VENTILATION
- ★ UNAFFECTED BY VIBRATION
- ★ MOISTURE RESISTANT
- ★ CORROSION PROTECTED



Steel Grid Resistors for COAL MINES Since 1915

P-G

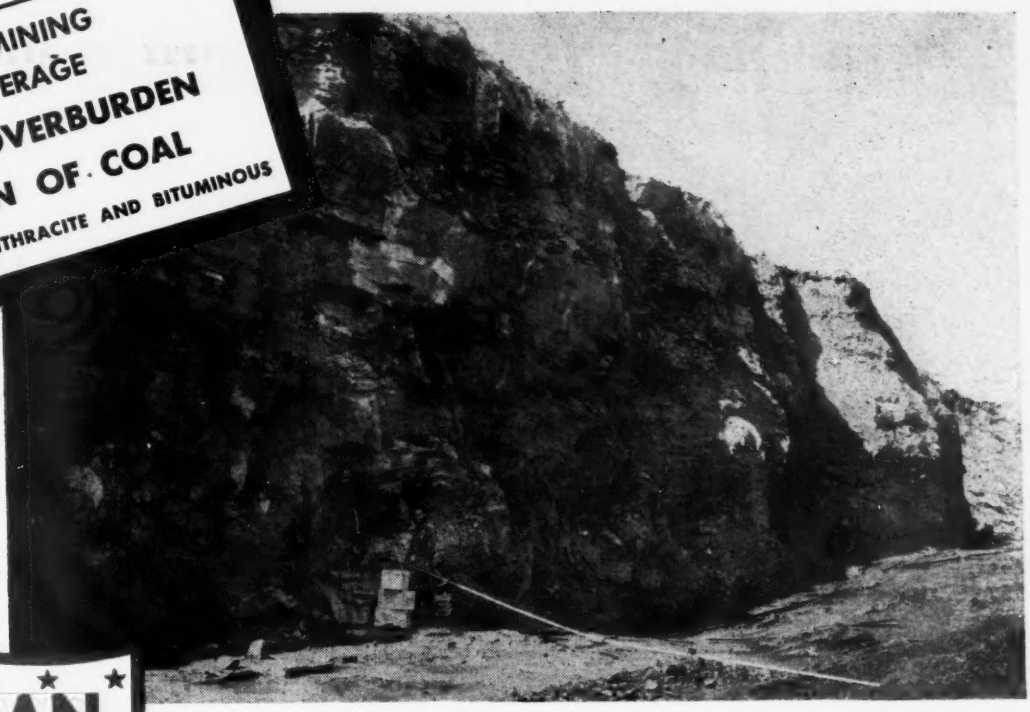
The Nonbreakable Steel Grid Resistor

THE POST-GLOVER ELECTRIC COMPANY

• ESTABLISHED 1892 •

221 WEST THIRD STREET, CINCINNATI 2, OHIO

IN STRIP MINING
YOU AVERAGE
7 TONS OF OVERBURDEN
FOR **1** TON OF COAL
COMBINED TOTAL—ANTHRACITE AND BITUMINOUS



AMERICAN
CYANAMID & CHEMICAL CORPORATION
EXPLOSIVES

The Correct Explosives will solve your overburden problems

Sandstone . . . limestone . . . shale . . . whatever the overburden encountered in stripping, proper drilling and the correct explosives will cleanly remove it . . . place it where you plan . . .

AMERICAN explosives and blasting accessories assure the proper characteristics as they are products of intensive research, chemical control, thorough inspection and unremitting care in manufacture.

- ***Capable field engineers are available at your call.***

★ **HIGH EXPLOSIVES**
★ **PERMISSIBLES**
★ **BLASTING POWDER**
★ **BLASTING ACCESSORIES**

American Cyanamid & Chemical Corporation

A Unit of American Cyanamid Company

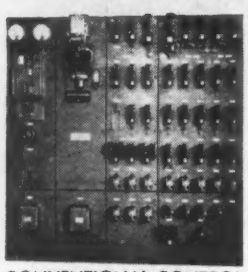
30 ROCKEFELLER PLAZA • NEW YORK, N. Y.

EXPLOSIVES DEPARTMENT

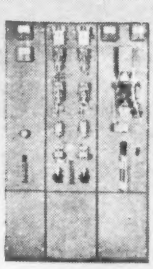
SALES OFFICES: Pittsburgh, Pa. Bluefield, West Va. Scranton, Pa. St. Louis, Mo. Chicago, Ill. Pottsville, Pa. Hazleton, Pa. Maynard, Mass.

More "Happy Landings" for this ore hoist!

ROTOTROL



CONVENTIONAL CONTROL



ROTOTROL

ROTOTROL

. . . simplest of *all* rotating controls

- All parts (except field coils) *interchangeable* with standard SK designs.
- Simple circuits . . . easy to understand . . . no involved maintenance problems.
- No auxiliary "gadgets" required . . . no mystifying capacitor-reactor circuits.

(Compare size of ROTOTROL and conventional control panels)

From 1715 to 1945 . . . 230 years of continuous operation . . . this eastern district iron ore mine—now 100% Westinghouse-equipped—has supplied the iron sinews of peace and war . . . from Valley Forge to Tokyo.

ROTOTROL was selected for the control of the new Westinghouse mine hoist equipment . . . to provide "feather-touch" accuracy, making possible faster and more accurate landings. Smooth and rapid acceleration permits more trips per hour with less electrical and mechanical stress . . . less lost time and lower maintenance . . . simplified control equipment.

Get the complete story on ROTOTROL today from your local Westinghouse representative . . . or write Westinghouse Electric Corporation, P. O. Box 868, Pittsburgh 30, Pa.

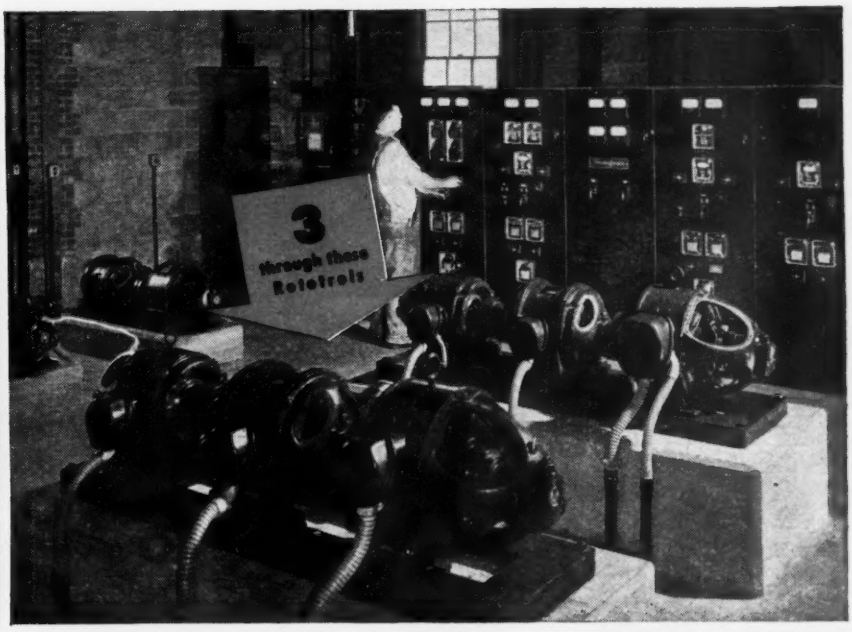
J-94697

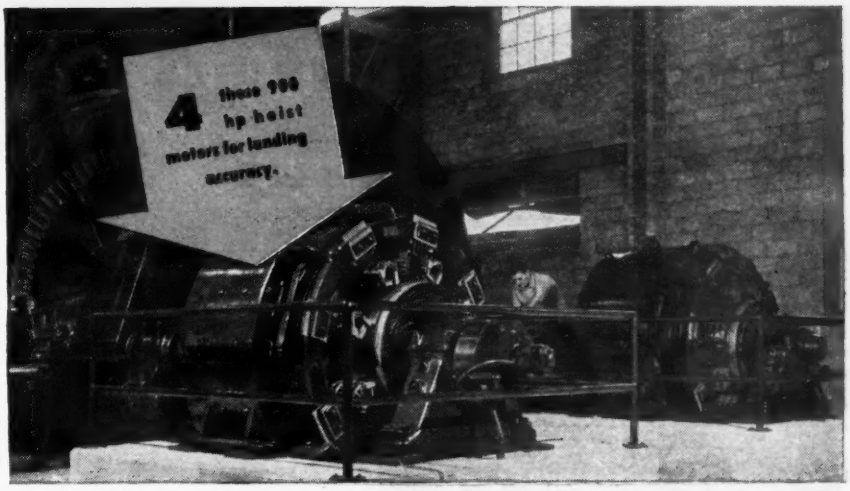
Westinghouse

MODERNIZES

this progressive 230-year old ore mine for

- **HIGHER PRODUCTION**
- **LOWER HOIST MAINTENANCE**





ROTOTROL OFFERS:

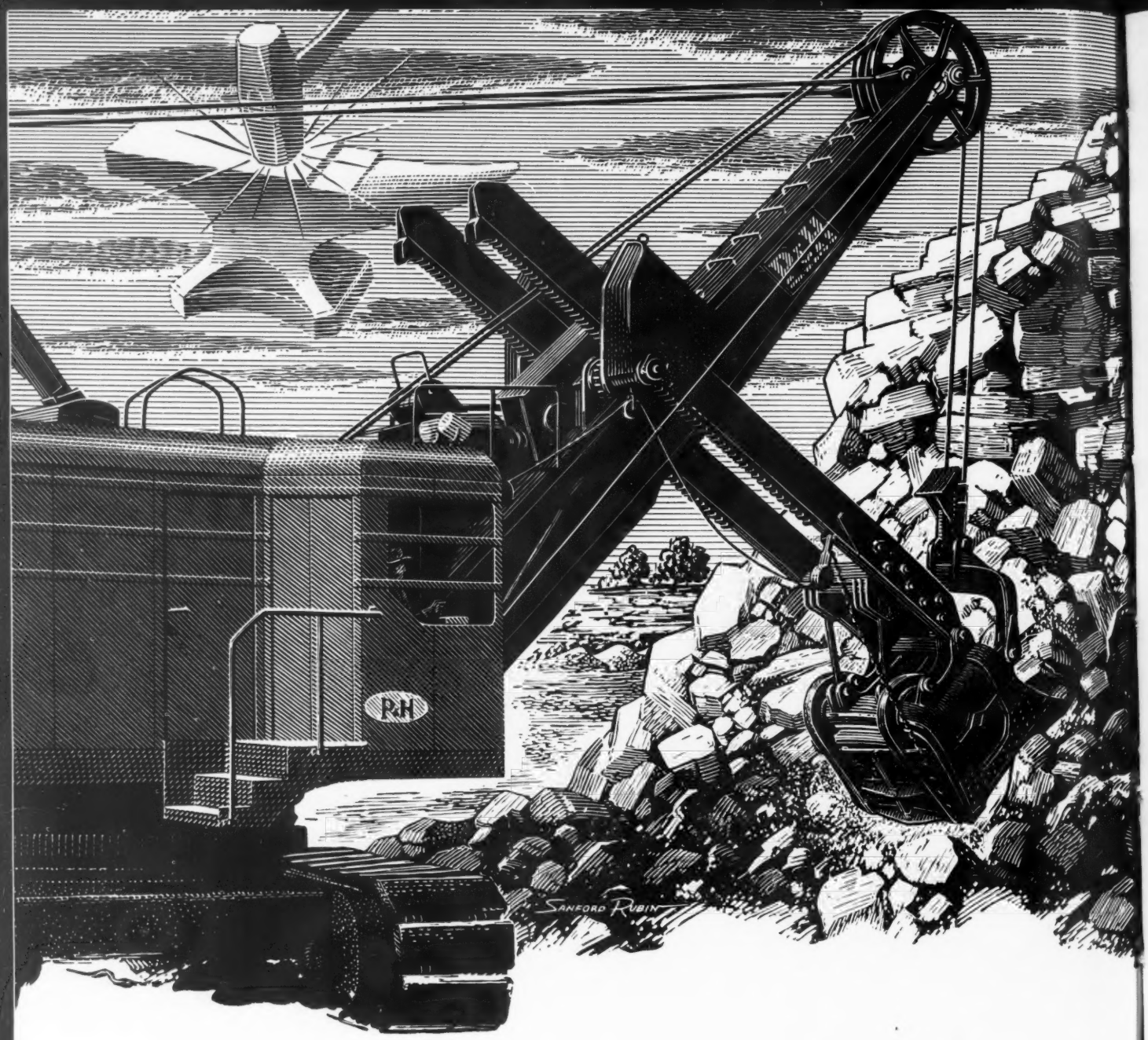
HIGHER PRODUCTION

- Maximum cycle efficiency.
- Accurate speed control.
- Accurate landings made quickly.
- Less "down-time" . . . minimum need for maintenance.

LOWER MAINTENANCE

- Current limit prevents overstressing ropes . . . increasing life of cables and wearing mechanical parts.
- No accelerating contactor or vibrating relays . . . simplest of *all* rotating controls.
- No involved circuits . . . no need for "high-powered" maintenance engineers.

OPERATING PARTNER IN THE MINING INDUSTRY



Pre-Treated For Shock

Maximum shock resistance is assured for this shovel by two simple facts. One is that rolled alloy steel excels in toughness under recurring impact. Fact two is that all-welded, deep box-section construction is the strongest design principle known.

The new P&H Electric Shovel combines these advantages to the finest degree in both upper and lower frames. Shocks and stresses encountered with every working motion are dissipated before they can reach vital mechanical parts. Design throughout is greatly simplified.

The boom, car body, and revolving frame of a P&H, for example, are welded into completely integral units with the right metal in the right place. All the weight in all parts is live working weight.

The greater rigidity of welded alloy steel prevents weaving, keeps the machinery in line.

Here's a typical P&H contribution in the interest of lower digging costs in open pits. The new P&H Electric Shovels embody many other equally important developments you should know about. Write for Bulletin X-83.

P&H ELECTRIC SHOVELS
4540 West National Avenue
Milwaukee 14, Wisconsin

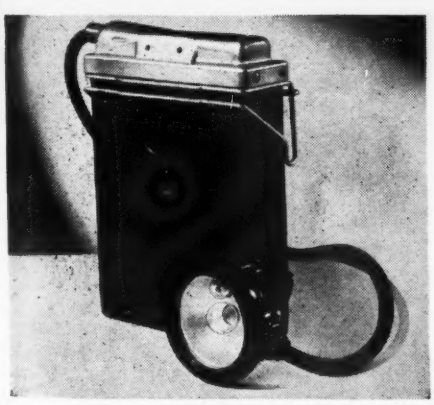
HARNISCHFEGER CORPORATION
EXCAVATORS · ELECTRIC CRANES · ARC WELDERS · P&H · HOISTS · WELDING ELECTRODES · MOTORS

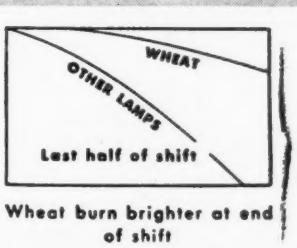
THE GREATEST FORWARD STEP EVER MADE IN ELECTRIC SHOVEL DEVELOPMENT

Tim Malloy says...

Do you know—

THE WHEAT LAMP MAINTAINS AN AVERAGE EFFICIENCY OF 90% OF ITS INITIAL DISCHARGE THROUGHOUT ITS LIFE.





Wheat burn brighter at end of shift

DO YOU KNOW— WHEAT Cap Lamps are the only mine lamps "powered" by Exide Ironclad battery plates made by the Electric Storage Battery Company, the world's largest manufacturer of storage batteries for every purpose.

DO YOU KNOW— The more active type of battery used by WHEAT produces more power per pound per cubic inch than any other type.

DO YOU KNOW—The WHEAT light beam is steadily maintained throughout the shift — a vital factor in any underground mining operation.

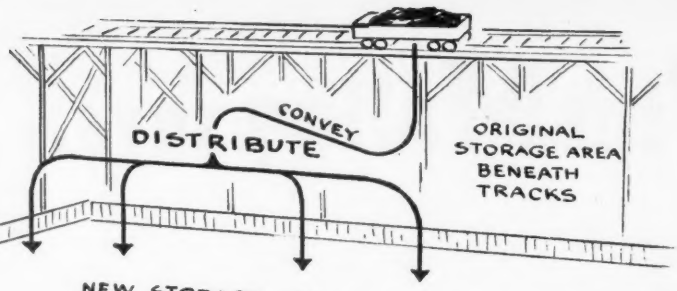
WHEAT—THE LIGHT THAT IS BRIGHT AT THE END OF THE SHIFT

Write today—
WHEAT LAMP SALES, INC.
1501 Kanawha Valley Bldg.
Charleston, W. Va.

MANUFACTURED BY
KOEHLER MFG. CO.
MARLBORO, MASS.
SPECIALISTS IN MINE LIGHTING FOR 30 YEARS

OTHER SALES REPRESENTATIVES
E. D. BULLARD CO.
San Francisco
Chicago
B. C. EQUIPMENT CO., LTD.
Vancouver, B. C.
H. C. BURTON & CO.
Hamilton, Ontario
OLDHAM & SON, LTD.
Manchester, England

The Problem — to remove coal from cars on elevated storage track and distribute over an auxiliary storage area quickly and economically



S-A Solution Gave Double Storage Capacity

Inclined belt conveyor carrying coal from track hopper to shuttle belt conveyor.

• An Eastern Coal Company required additional storage space with a minimum of new equipment. The original storage space under the dump car trestle accommodated 25,000 tons.

S-A Engineers surveyed the situation and recommended the following: 1—installation of a track hopper midway along the trestle; 2—an inclined belt conveyor leading from the hopper to a 150-foot shuttle belt conveyor; 3—a 300-foot trestle paralleling the original trestle over which the conveyor can be moved by means of its own reversible electric power.

This simple solution doubled the company's storage capacity to 50,000 tons and it was accomplished economically with a minimum of equipment and effort.

Let S-A Engineers recommend an equally satisfactory system for your conveyor problem.

View showing completed storage installation with extra 25,000 ton capacity.

STEPHEN S-A DAMSON MFG. CO.

2 RIDGEWAY AVENUE, AURORA, ILLINOIS — LOS ANGELES, CALIF. ★ BELLEVILLE, ONT.

Designers and Manufacturers of All Types of

BULK MATERIAL HANDLING EQUIPMENT

LOW COST 'Burden Removal

Specially Designed 20 CU. YD. UNIT COMBINES CAPACITY, SPEED, TRACTION

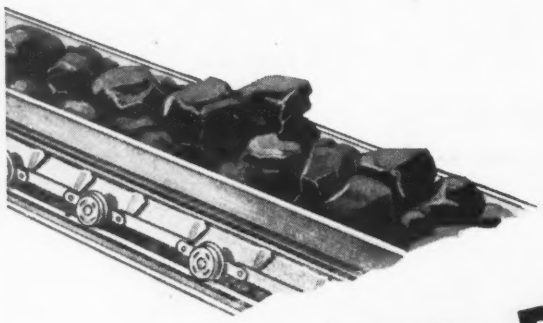
HANDLES HUGE ROCKS EASILY—Here's speedy handling for every material—even rock overburden. Side-dump, drop-door trailer permits immediate dumping, eliminates backing up or maneuvering into dumping position. Saves time and fuel.

Now, coal strippers have a high tonnage unit for overburden removal. Despite its enormous size, this Walter Tractor Truck easily navigates the rugged, wooded, broken ground and soft dirt encountered in opening stripping areas. When not used for overburden, it transports coal profitably since it hauls big payloads at high speed and easily climbs steep grades.

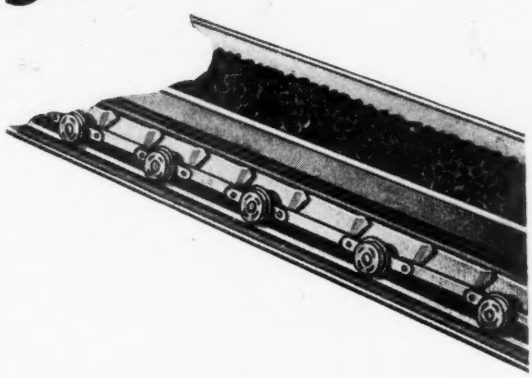
The Walter Tractor Truck hauls the side dump trailer through soft dirt, deep mud and over slippery surfaces without slipping, stalling or bogging down because its Four Point Positive Drive prevents wheel spinning. Three Automatic Locking Differentials proportion the power to the FOUR driving wheels according to the traction of each wheel at any instant. Has 300 H.P. engine and many other features including hydraulic steering and powerful air brakes that promote safety and prevent driver fatigue. Write for detailed literature.

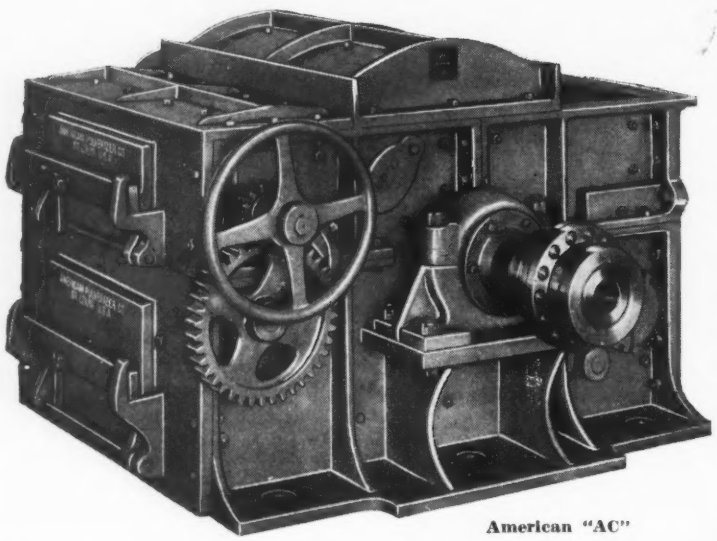
WALTER
TRACTOR TRUCKS

Walter Motor Truck Co.
1001-19 Irving Ave., Ridgewood 27, Queens, L. I., N.Y.



American ROLLING RING Crushers for HIGHER PRODUCTION OF MARKETABLE SIZES . . . .





American "AC"

Better preparation of all grades of coal is made possible—with no oversize and a minimum of fines

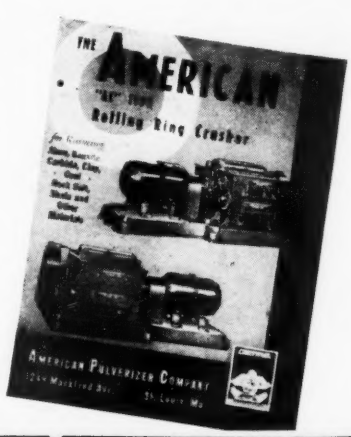
The Shredder Ring principle, exclusive with American Rolling Ring Crushers, **splits coal instead of crushing** it, resulting in a uniform product with minimum fines. Each manganese shredder ring, with 20 cutting edges, strikes the coal with terrific centrifugal force — yet it revolves freely on its shaft and deflects undamaged from tramp iron.

With the big demand swinging to stoker sizes and commercial screenings —for efficient firing—modern coal preparation calls for an improved, low cost, uniform crusher output.

There are 9 sizes of American Rolling Ring Crushers to meet these requirements. There is an American to fit your operation — whether it's a one step or a closed circuit operation. Capacities from 40 to 500 TPH with a wide range of reduction.

American's efficient Shredder Ring principle and advanced design assures low operating cost — in most cases, *less than 1¢ per ton.*

Ask any of the many operators of Americans!



Keep abreast on coal preparation— send for this bulletin—

American PULVERIZER COMPANY

Originators and Manufacturers of Ring Crushers and Pulverizers

1119 MACKLIND AVE.
ST. LOUIS 10, MO.

INSTALLED FOR AN 8 HOUR DAY . . .

This installation consists of two 24" conveyor belts, each 835 ft. long, running side by side on an incline. They are operating at one of the largest power producing plants in the Middle West. The installation was originally designed for an eight-hour day. Now, on account of the requirements of the war effort, the belts are being operated sixteen hours daily . . . and furthermore, the installation has been stepped up in belt speed about one-third.

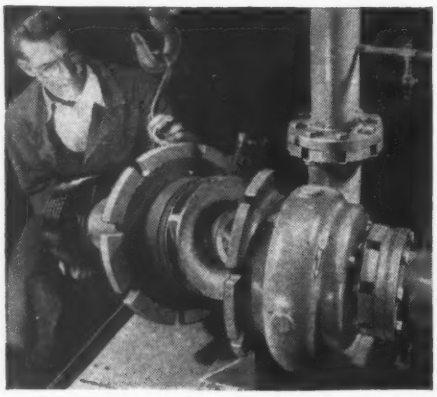
All BWH conveyor belts are engineered and built to conform to certain definite conditions of speed, load and abrasion. Nevertheless, there is always present in BWH belts sufficient quality, stamina and inherent strength to pinch-hit on harder work if conditions demand, as is abundantly proven in this instance.

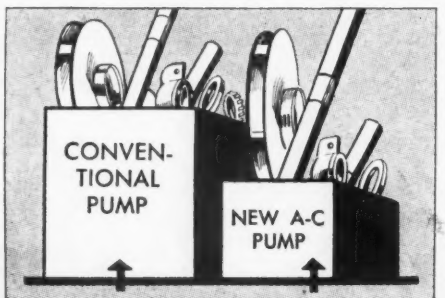
BOSTON WOVEN HOSE & RUBBER CO.

WORKS: CAMBRIDGE, MASS., U.S.A.
P.O. BOX 1071, BOSTON, MASS., U.S.A.

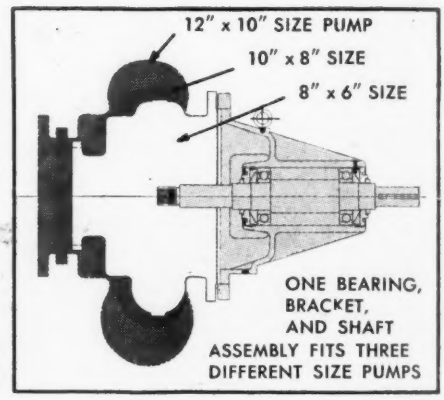
Remove Entire Rotating Element WITHOUT DISTURBING PIPING

Get 2 to 4 Times Longer Life, Cut Parts Inventory Much as 2/3, With New A-C Solids-Handling Pumps!





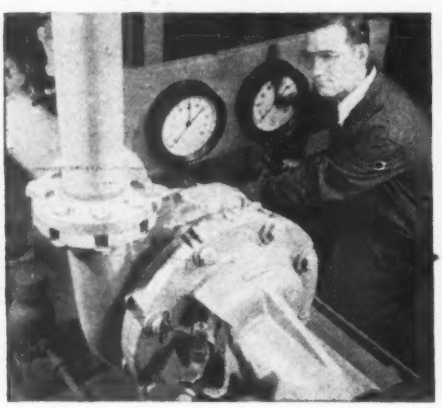
Actual comparison will show that new "Solids-Handling" Pump has up to 50% fewer parts than conventional pumps.

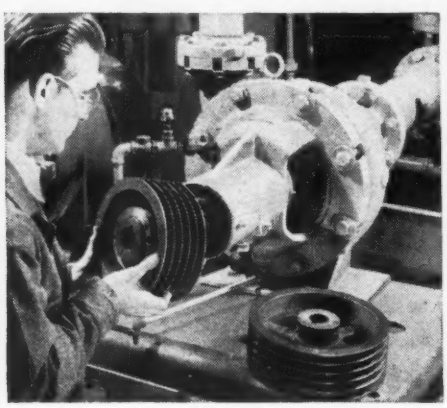


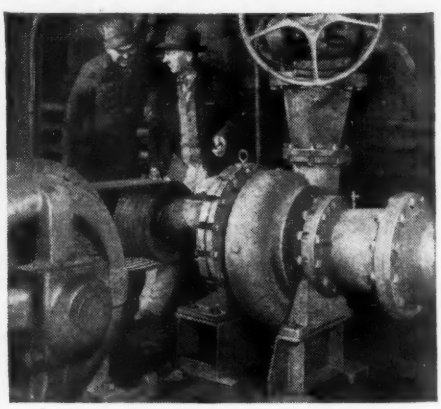
1 Maintenance is *simple* with new A-C Solids-Handling Pump! One reason: You can remove *entire* rotating element without disturbing piping—you can knock-down, re-assemble entire pump in little as ½ hour!

2 Up to *50% fewer parts* than other makes means *simpler* operation. It also means *important savings in inventory!* Using a number of comparable size pumps, you can reduce parts inventory much as ⅔! Here's how . . .

3 Comparable size pumps of different ratings have interchangeable parts. For example: 8 x 6, 10 x 8, 12 x 10 sizes have *same* bearings, bracket, shaft assembly. You stock *1* set of parts for *3* pumps! That's not all . . .







4 These new pumps give you *2 to 4 times longer life* than ordinary pumps! Reasons: *new* design, *special* alloys. What's more, they compare favorably in price with ordinary high efficiency pumps! And *range?*

5 By merely changing motor and drive, or drive alone — you get *wide* capacity range, up or down. You don't have to touch pump or parts — *not even impeller!* Summing it all up, here's what one operator reports . . .

6 "Downtime cut 400%; power savings $7 a day; parts inventory cut 70%!" No wonder new A-C "Solids-Handling" Pump gives you a *lower cost per ton of solids handled than comparable makes!* A 1912

WANT MORE FACTS? Call this experienced engineer in your nearby A-C district office. Discuss your pumping problem with him. Or, Write direct for Bulletin B6381. ALLIS-CHALMERS, MILWAUKEE, WIS.

ALLIS-CHALMERS
"Solids-Handling" Pumps

CARDOX

"THE NON-EXPLOSIVE MINING METHOD"

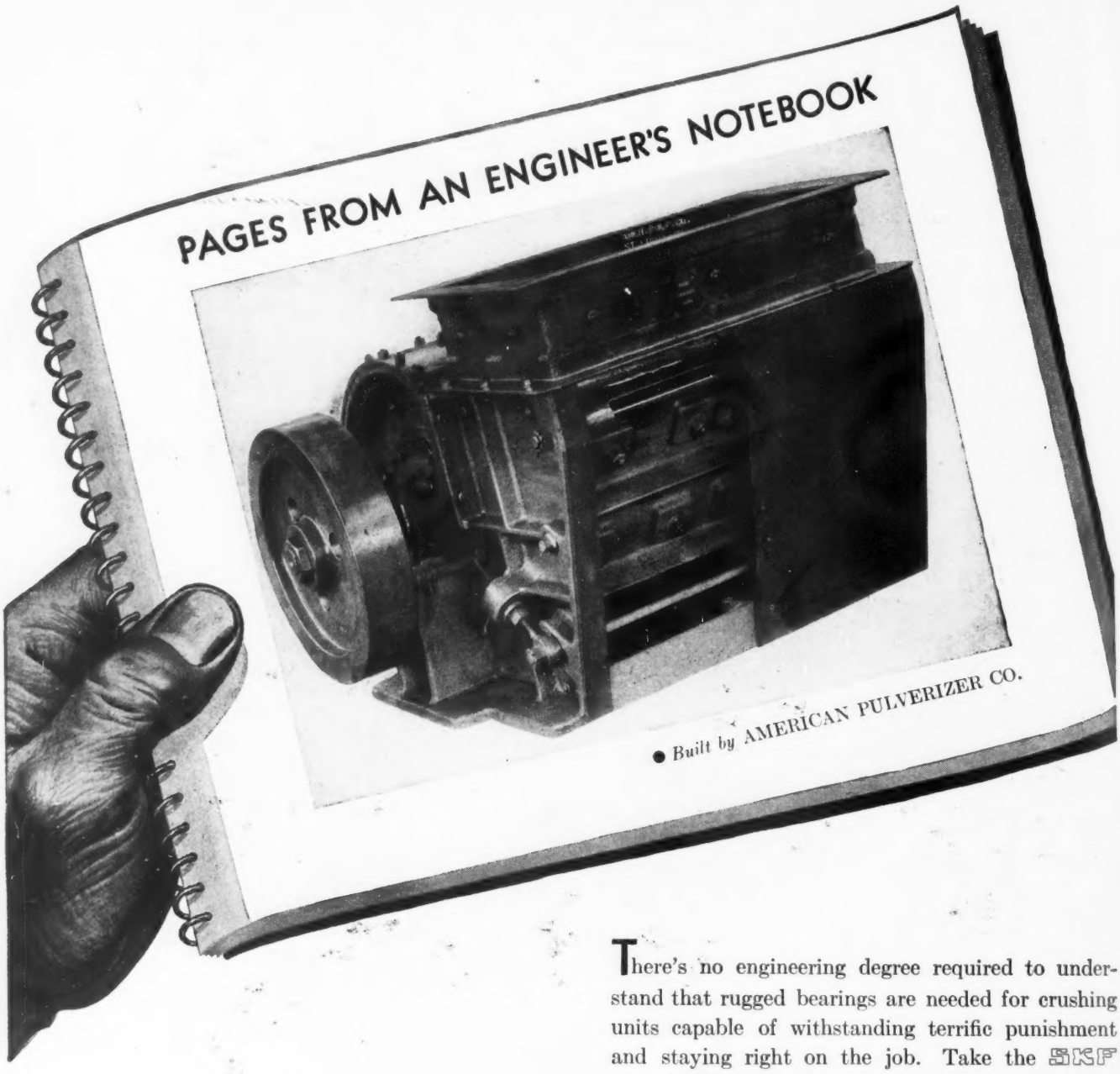
MAKES YOUR MODERN MECHANIZED EQUIPMENT *pay bigger dividends*

CARDOX
HARDSOCG DRILLING EQUIPMENT
Complete line of drilling equipment designed to give you the maximum in drilling efficiency.

● CARDOX increases the efficiency of mechanized equipment in many ways. It makes possible the use of longer cutter-bars. It rolls out the coal for faster, easier loading... with less wear on mechanical loaders. Its gentle heaving action produces more coarse sizes . . . which are more economical to clean. CARDOX-mined coal will not crumble when subjected to extensive mechanical handling. It is firm and remarkably free from shatter-cracks.

· Write for full details on free demonstration of CARDOX under your current working conditions.

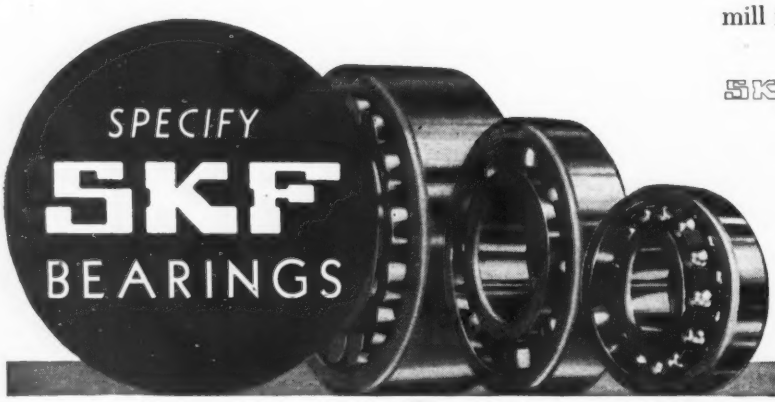
CARDOX CORPORATION · Bell Building · Chicago 1, Ill.



FOR THE MOST TONNAGE PER HOUR!

There's no engineering degree required to understand that rugged bearings are needed for crushing units capable of withstanding terrific punishment and staying right on the job. Take the SKF Spherical Roller Bearings on this American hammermill, for instance. In dust-tight SKF Pillow Blocks equipped with dust flingers, these bearings reduce maintenance cost to the bone. Having rolling alignment, they compensate for shaft deflections, distortions or weave without binding . . . maintain their high load carrying capacity. When a hammermill is SKF-equipped, it's well-engineered. 5884

SKF INDUSTRIES, INC., PHILA. 34, PA.



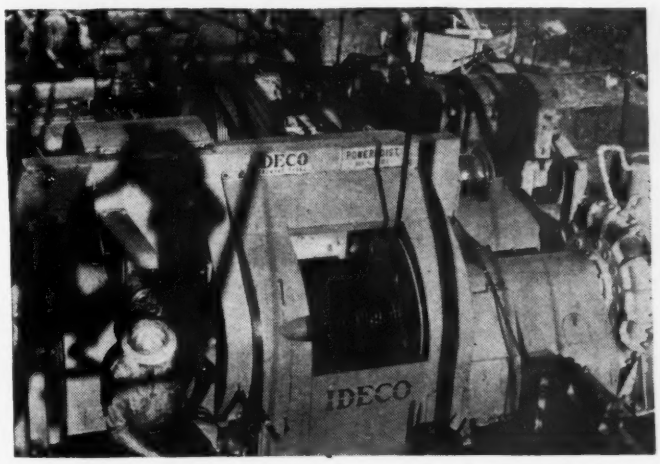
THE CLUTCH THAT STOPPED CLUTCH TROUBLE

Here is the one truly modern clutch for all heavy duty industrial drives.

It controls power and torque through a cushion of air —with as firm a grip or as light a grip as the job requires. It has no springs, arms, levers or toggles—requires *no* lubrication and little maintenance.

It is the Fawick Airflex Clutch—proved for superior performance and economy—in hundreds of industrial applications and in thousands of Diesel-driven Navy ships.

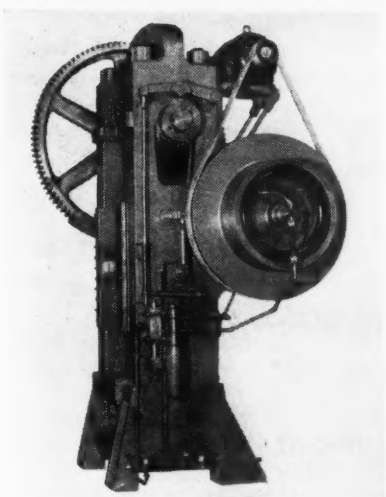
Let us help you engineer clutch trouble *out* of your machines. Book on request.



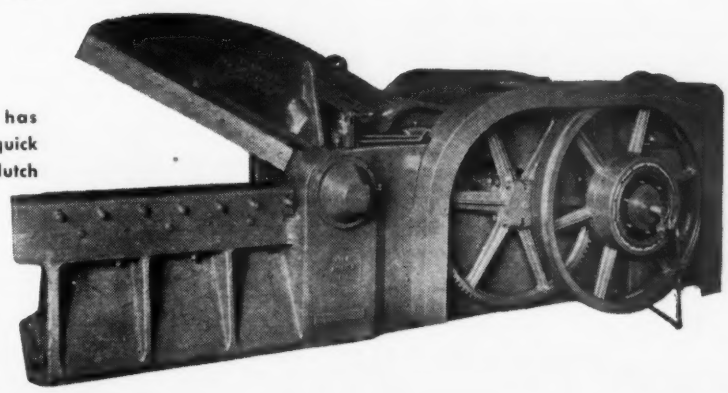
Oil-well drilling rig—equipped with 11 Fawick Clutches.

▲ Modern power shovel gives full-time operation through dependable Fawick Clutches.

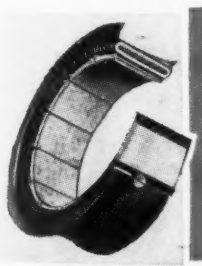
Steel rolling mill Fawick-equipped for smooth, even power.



◀ Heavy duty press has smooth starts and quick stops with Fawick Clutch and Brake.



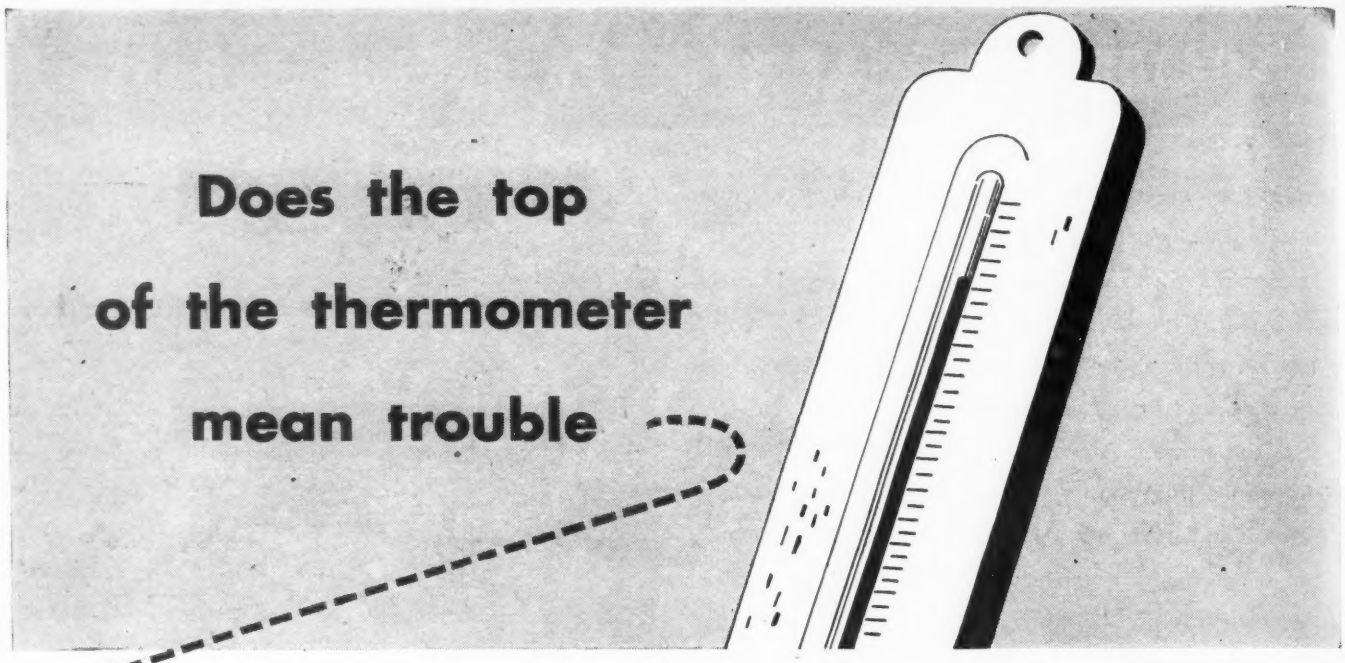
▶ Alligator shear operates through Fawick Clutch and Brake.



FAWICK *Airflex* CLUTCH

FAWICK AIRFLEX CO., INC. • 9919 Clinton Road, Cleveland 11, Ohio

In Canada, Reynold-Coventry Ltd., Montreal, Toronto, Vancouver • In British, Crofts Engineers, Ltd., Bradford, England



that *High Safety Factor* Electrical Insulation can prevent?

Many an engineer gets the jitters when the mercury shoots up. For heat, either ambient or internally generated, is one of the chief causes of motor trouble. Because most motors are designed by experts and manufactured by experienced craftsmen, they give years of economical service. Yet, the records show that motor failure, due to heat, overloads, dirt, corrosive acids, moisture and the human element, still imposes a heavy time-and-dollar loss on industry.

That is why Fiberglas* Insulation Materials are being used on more and more motors. It provides the "extra" protection against the conditions which cause most motor burnouts — affords the *high safety factor* which prevents many unnecessary losses.

OPERATORS CHANGED THE DESIGNER'S PLANS

The original design for a metal melting tank specified the use of one-horsepower motors to drive a centrifugal pumping system. The motors were to run into the furnace on tracks about 18 inches above the surface of the molten metal. After the operation was completed, the motors were to be withdrawn.

However, in order to speed up production, and because the tracks warped, operators left the motors over the melting tank rather than remove them. The life of the motors (insulated with an organic material) was about two weeks.

The first motor to fail was rewound with Fiberglas. The motor was then installed permanently, directly over the molten metal, where it has been operating for nearly a year in an ambient of at least 250° F. The operation cycle is three minutes out of every thirty.

You, too, may be able to effect similar time and money savings by using or specifying *high safety factor* insulation. Start now to give your motors and other electrical apparatus the advantages which only Fiberglas Insulation Material affords. For complete information consult your electrical repair shop, the nearest Fiberglas Distributor, or write for a copy of catalog EL 44-7. *Owens-Corning Fiberglas Corporation, 71RP Nicholas Bldg., Toledo 1, Ohio.*

In Canada, Fiberglas Canada Ltd. Oshawa, Ontario.

ASK FOR FIBERGLAS—IN YOUR NEXT NEW MOTOR—AND ON YOUR NEXT REWIND

FIBERGLAS

ELECTRICAL INSULATION MATERIALS

*T. M. Reg. U. S. Pat. Off.

THERE'S A COMPLETE LINE OF FIBERGLAS ELECTRICAL INSULATIONS

YARNS • TAPE • CORD • SLEEVING • CLOTH AND OTHER FORMS. Also available in: Magnet wire, Lead wire, Special wires, Varnished cloth and tape; Mica combinations: Laminates, Saturated sleeving, Varnished tubing, Pressure-sensitive tapes, Special products.

ONIONS GO TO SEED AT THE TOP—

A GOOD SALES FORCE IS LIKE THAT TOO . . .

IF, because they can, some coal producers let their selling facilities get "seedy" now, they will deserve the left-handed standing they will earn in the post-War competitive blitz.

A mental "Charley-horse" is one of those things which fools business men into thinking exclusively of today. You'll get one if you try to save a few 1945 dollars at the expense of tomorrow's sales efficiency.

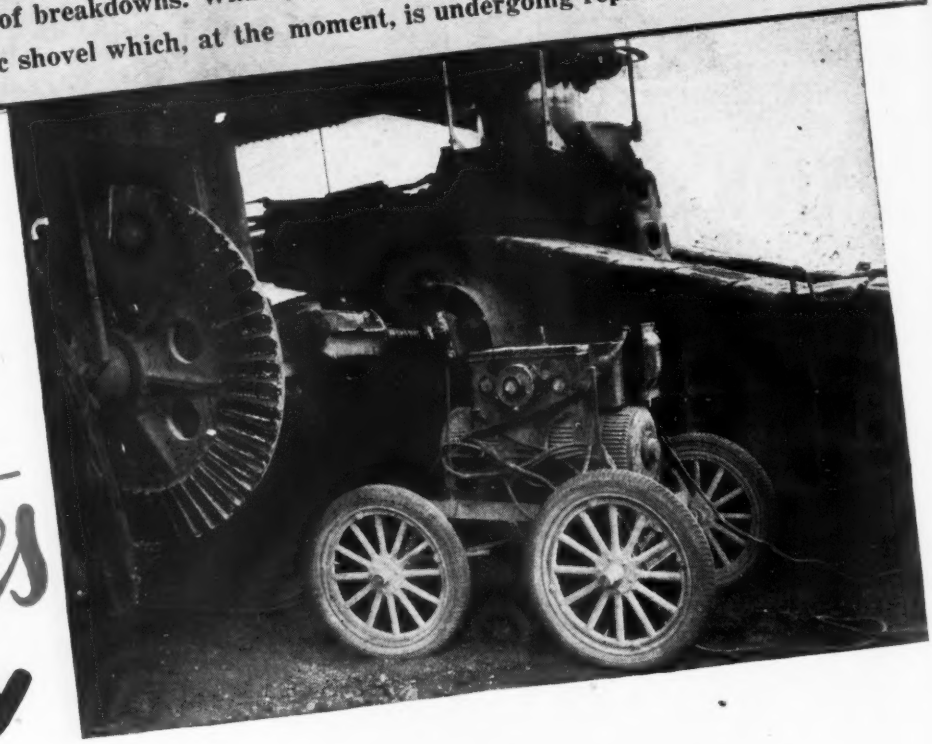
Anyone can take advantage of an emergency. But, *very soon*, coal will have to be sold again. You'll need sales connections with no seeds at the top.

Your only insurance against an empty order file tomorrow is a good sales connection . . . today.

AMERICAN COAL ASSOCIATION

AMERICAN COAL *Sales* ASSOCIATION . . . Washington, D.C.

It costs money every time a big machine like this takes "time out" from production because of breakdowns. What you are actually looking at is a corner of a very large electric shovel which, at the moment, is undergoing repairs by welding.



Minutes MEAN MONEY

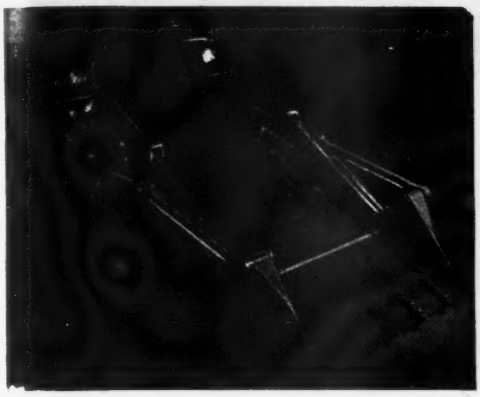
Of course Simplex-TIREX Selenium Rubber Armored Welding cable is being used. We say "of course" because TIREX with its Selenium Rubber Armor is the toughest, most abrasion-resistant jacket there is around. It's the kind of a jacket that takes all the abuse that comes its way and keeps right on going without showing signs of cuts, tears and other troubles.

Best of all, these TIREX Selenium Rubber Armored cables give very long life which means that you won't have to replace them nearly as often as you would cables that do not have the same tough outer jacket. Remember to specify TIREX the next time you need welding cables.

Simplex Wire & Cable Co., 79 Sidney Street, Cambridge 39, Mass.

ARMY E NAVY

Simplex WIRES and CABLES



The loader with the natural, smooth easy, shovel-action loading head.

Here's the Machine That Will Load—In Its Stride—Any Lump of Coal That Will Pass Through Your Tipple, or Any Lump of Rock Your Cars, Aerial Tram or Larry, Can Take.

★ Every mine needs such loader service, and you can get it with the "Whaley Automat". This high production machine is the only one with an automatic, natural-action, shovel. It is also the only machine with a parallel-lift rear conveyor.

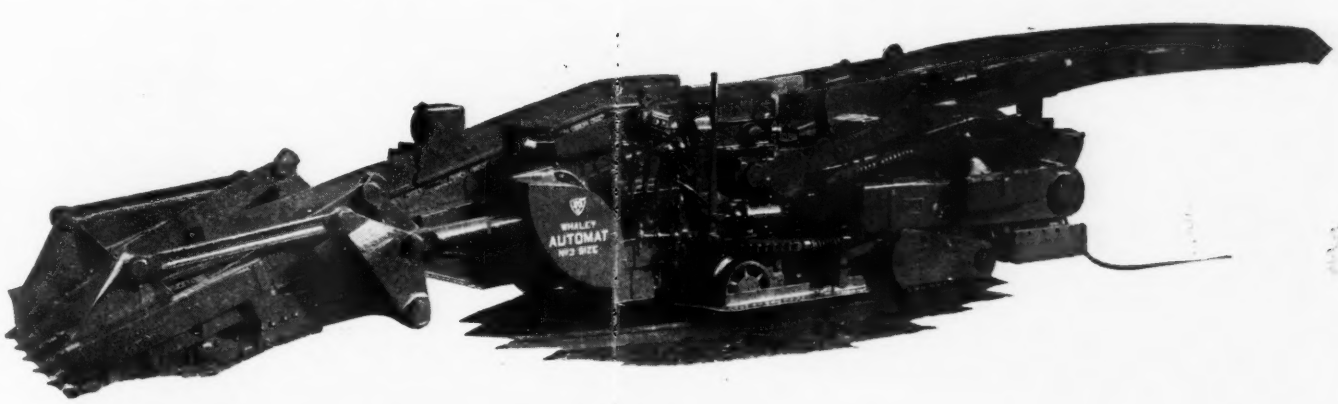
The automatic shovel action permits cleaning up down to the pavement without taking soft bottom, loading—in its stride—any lump of coal that will pass through your tipple, or, if in rock work, loading any size rock your cars, aerial tram, or larry, can take.

The exclusive parallel lift rear conveyor, always parallel to track, permits taking full advantage of seam height for maximum loading of cars.

In addition, the "Automat" power requirement is only one motor of 25 H.P., and the power consumption only one-fifth KWH per ton of material loaded.

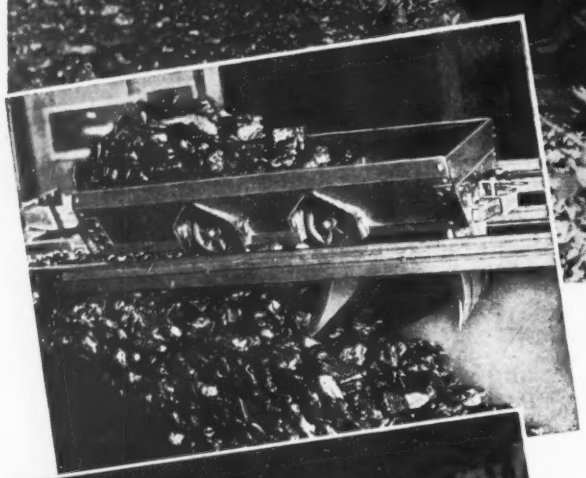
The "Automat" merits your investigation if you plan to mechanize coal or rock loading. Myers-Whaley Company, Manufacturers, Knoxville 6, Tenn.

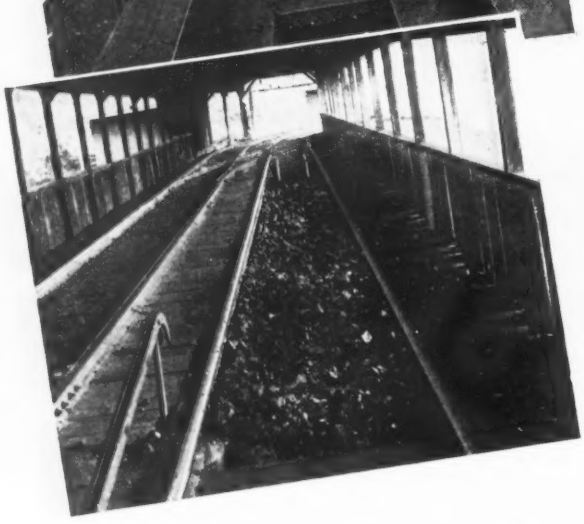
Wm. Neill & Son, Ltd., St. Helen's Junction, Lancashire, England, are licensed for Manufacture and Sale in Great Britain and Europe.



★ MYERS-WHALEY

Mechanical Loaders Exclusively For Over 37 Years





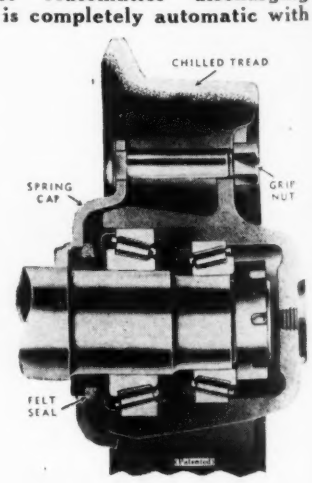
MORE TONNAGE WITH FEWER CARS AND LESS MANPOWER

If we were to tell you that your savings, after installing S-D "Automatics", would pay for these new cars in twenty-four months, your answer probably would be—"I don't believe it". It *is* unbelieveable, yet it happens, and your own mine may be one where such savings are possible.

We know of mines where these savings can be made, but the operators never will realize why S-D "Automatics" are so essential to maximum production, minimum manpower, and lowest production costs in mining until they see these cars in operation . . . see why fewer S-D "Automatics" are required for any given tonnage . . . why savings of manpower is so obvious. See the constant, even flow of trains of loaded cars ride across the dumping bin and, while in motion, lay the coal down gently in 1-2-3 door order—one door at a time—and at the rate of 20 or more cars per minute.

The three small photos on this page illustrate features of the new S-D "Nockout Automatic". Top—the 1-2-3 door action. The first door has lain its coal down with no unnecessary breakage. Door No. 2 is laying its coal down as the slope of coal permits. Door No. 3 will follow. Next below—a train of "Automatics" discharging coal—not a man in sight. Discharging is completely automatic with the "Nockout". At bottom—"Automatics" fill a bin level full. This feature permits continued mine operation if, for any reason, screening plant is down.

The S-D "Nockout Automatic" is your answer to More Production with fewer cars and minimum Manpower.



Sanford-Day Iron Works, KNOXVILLE, TENNESSEE

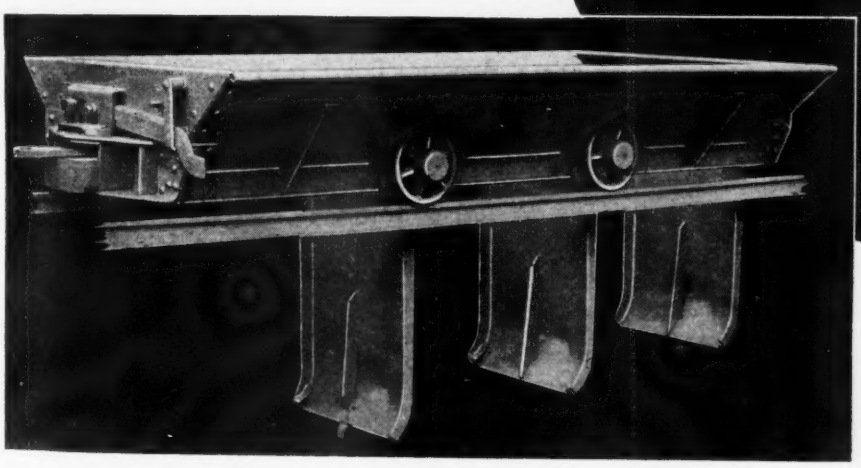
You Need S-D 1-2-3 "Automatics"

S-D Automatic Mine Cars are, unquestionably, today's most vital equipment necessity in many coal mines for increasing tonnage and conserving manpower. Many installations have proved this fact, while reducing operating costs tremendously, by changing over to S-D "Automatics". These case histories of known savings warrant our making S-D "Automatics" available to the progressive operator without his investing a dime.*

Now, S-D "Automatics" are available with another improvement—the S-D "Nockout" door releasing mechanism—the greatest improvement made in automatic cars since we developed the 1-2-3 method of door operation.

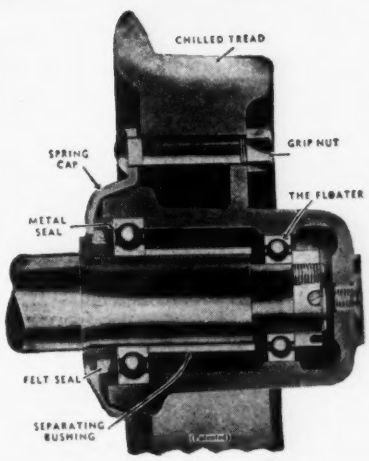
The customary door releasing mechanism (shown below) has been eliminated entirely. No projecting latch-lever . . . nothing on end of car to be damaged. Note the new latch end illustrated at right (circle)).

Our new "Nockout" door releasing mechanism is in a completely protected position. Accidental dropping of doors is next to impossible. Two separately operating latch hooks must be disengaged simultaneously for releasing the doors. This is done by the nockout devise, at the storage bin. Operation is completely automatic. No manual labor can be of any assistance whatsoever, consequently all labor is eliminated. (Of course, doors can be tripped manually when desired).



YOU WANT THIS PERFORMANCE

We know that every mine operator wants the performance Sanford-Day precision bearing wheels render. Yet, the operator never can appreciate what these closed hub, demountable, automatically adjusted bearing wheels mean in power and lubrication savings until he tries them. This is the reason we offer them on Free Trial. We know what the saving results will be. We want the operator to discover this in his own mine. Both wheels, The S-D "Floater" at right and the Timken Roller Bearing wheel at left, carry our liberal guarantee. In addition, our patented annealing process plus our 42 years of designing and manufacturing wheels assure you of the most satisfactory wheel performance the mining industry has ever known.



*READ THIS RENTAL OFFER

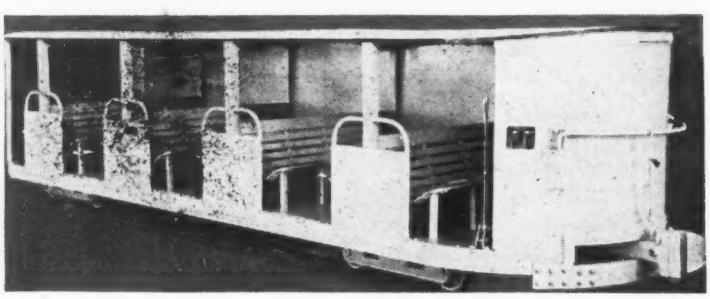
To back our claims of more production with fewer cars, less manpower, and worthwhile cash savings with S-D "Automatics", we are willing to furnish these cars to any good operator on a liberal rental plan. We call it "liberal" because the savings from the use of the cars amount to more than the rental payments. Then, after having experienced the actual savings of S-D "Automatics", if the operator prefers to own the cars, he may exercise his option to buy them and the rentals stop. With this plan the cards are on the table, face up.

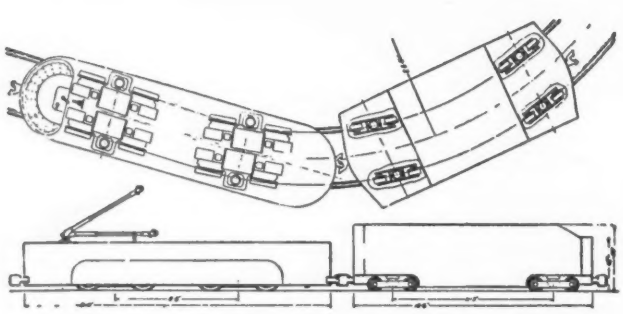
We know what the cars will do to help you meet coal production demands. You can't lose. Let us give you all details now!

Sanford-Day Iron Works, KNOXVILLE, TENNESSEE

DIFFERENTIAL MAN-TRIP CARS

for fast, safe, low cost transporation





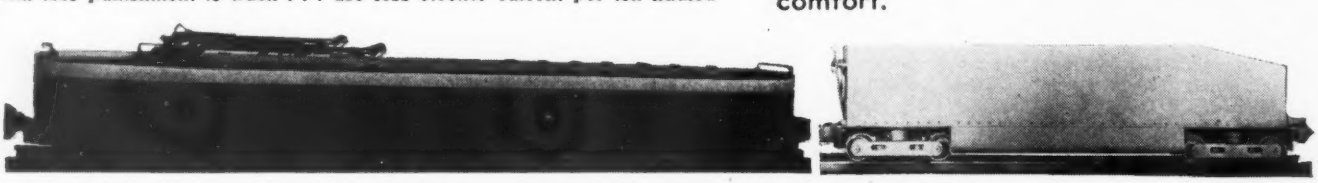
Differential 360 horsepower 8-Wheel AXLESS Locomotives and 10-ton 8-Wheel AXLESS Mine Cars increase mining capacity, and reduce mining costs. Provide more adhesion for tractive effort and braking . . . pull longer trains at higher speeds with greater safety . . . haul greater loads with less punishment to track . . . use less electric current per ton hauled

● This sturdy Man-trip car with Differential 8-Wheel AXLESS Trucks meets the need for safe, rapid transportation of men to and from working places underground.

It provides a comfortable, clean, dry ride for the men. The car is 22 feet long—seats 38 men—can negotiate a 30 foot radius curve.

Steel construction is used throughout with wood top over the metal roof as a protection in event trolley wire is encountered. Both ends and trolley wire side are fully enclosed. This prevents men from getting out on the wire side and avoids costly accidents. This also protects men from roof falls, rock dust, water, and shields them from cold intake air in winter.

These Man-trip Cars with Differential AXLESS 8-Wheel Trucks provide faster transportation with safety, getting the men to the working place quicker—and in comfort.



DIFFERENTIAL STEEL CAR COMPANY

FINDLAY, OHIO, U. S. A.

Builders of Haulage Equipment Since 1915

AIR DUMP CARS · MINE CARS · MINE LOCOMOTIVES · ROCK LARRIES · DUMPING DEVICES
BURDEN-BEARING LOCOMOTIVES · STOCKPILING CARS · COMPLETE HAULAGE SYSTEMS

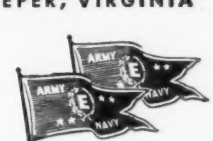
NOT WHAT YOU PAID . . . but how often you paid for replacements . . . determined the value in wire rope. Rochester ropes usually proved their quality to users by lasting longer . . .

FOUR YEARS of government production, however, have afforded convincing evidence of Rochester quality. The Armed Forces wanted only the best. And Rochester standards, for every grade and size, **were always in excess of Army and Navy specifications!**

EXTRA VALUE built into Rochester ropes makes the best wire rope the lowest in cost . . . With war needs satisfied, Rochester ropes of all types, sizes, grades and constructions, are again available for prompt shipment.

ROCHESTER *Ropes*

JAMAICA, NEW YORK • CULPEPER, VIRGINIA



Culpeper, Va., and Jamaica, N. Y., plants

JOY EQUIPMENT

is simple to operate
wears longer
repairs easily
produces tonnage at low cost

JOY MANUFACTURING

G COMPANY, FRANKLIN, PA.

You provide the Common Sense!

We've done all we can! We've manufactured Safety Fuse to the same fine standards of uniform dependability for over a century. We're sure that Safety Fuse, *properly used*, will give good results every time. But we can't provide the common sense needed to assure safe and effective blasting.

That's *YOUR* job! It's up to you to follow all the simple rules time has proved give safest and best results.

When using Safety Fuse, a clean, square cut, snugly seated inside the cap, firmly crimped, centered in the primer cartridge, and securely tied in place . . . these are the best insurance against misfires. Then, *don't short-fuse*! Give yourself plenty of time to walk to a safe place. Remember . . . the right way is the safest way!

S-19

THE ENSIGN-BICKFORD COMPANY Simsbury, Connecticut

Since 1836

ALSO PRIMACORD-BICKFORD DETONATING FUSE

ENSIGN-BICKFORD *Safety Fuse*

Coal Age

DEVOTED TO THE OPERATING, TECHNICAL AND BUSINESS PROBLEMS OF THE COAL-MINING INDUSTRY

Ivan A. Given, *Editor*

OCTOBER, 1945

Answer No. 1

LIFTING of the 80-percent rule governing retail deliveries Sept. 12 was good news to coal men struggling with the problem of improving consumer relations in the face of unrestricted oil deliveries and a new drive for business by the oil and oil-burner industries. With coal already handicapped by manpower losses and work stoppages, with consequent reduction in ability to produce, the situation rapidly was becoming intolerable when SFA wisely ended delivery restrictions. Although that decision, of itself, will not add greatly to supplies, the psychological effect should materially ease the problem of coal—particularly anthracite.

The end of delivery restrictions, however, by no means ends the problem of competition in the vital domestic and commercial market. What was described as an oil-burner black market in the New York *Times* of Sept. 12 is evidence that oil and other competition are not going to down easily. This, plus persistent reports that "Big" and "Little Inch" will carry natural gas, plus other competitive moves, are only partially offset by such developments as advertisements by Hearn's department store in the New York newspapers starting Sept. 16 that it had entered the field of automatic-stoker sales.

Competition will remain tough, but that is no sign that coal is without an answer—in addition to economy and quality. The answer is merchandising—merchandising in its broadest sense of doing everything possible to make coal use more convenient, satisfactory and economical for the consumer. Modern merchandising goes far beyond the more limited sphere of "selling." It has produced results for other industries, including competition, and it can produce results for coal. Now, if ever, is when an all-out effort will yield dividends.

Second New Deal?

MORE of the same was ostensibly President Truman's prescription for the future in his first peacetime message to Congress Sept. 6. Not only did he indorse the principles of the First New Deal; he elaborated on them and suggested additions. Does this mean a Second New Deal? It depends upon Congress and, even more, on the Presidential attitude. Many feel that Truman will leave it up to Congress and, further, that he will refrain from the practice of his predecessor of coercing members or gaining his ends, when denied a rubber stamp, by executive decree or other subterfuges of doubtful constitutionality.

Regardless of executive attitude, however, all signs point to increased pressure for Congressional approval of more competition with and restriction of business. President Truman's message, for example, went whole hog for government hydro power and river-valley authorities. It will be the text of a large and vocal bloc. So far, however, there is no need to assume that all is lost—or that all is safe, either. But industry has plenty to recommend it and there is evidence that many members of Congress and a substantial body of the public are willing to give it due credit. By doing everything possible to give employment at good wages, serve the public well and make sure its accomplishments are understood, industry can go far in cashing in on that willingness.

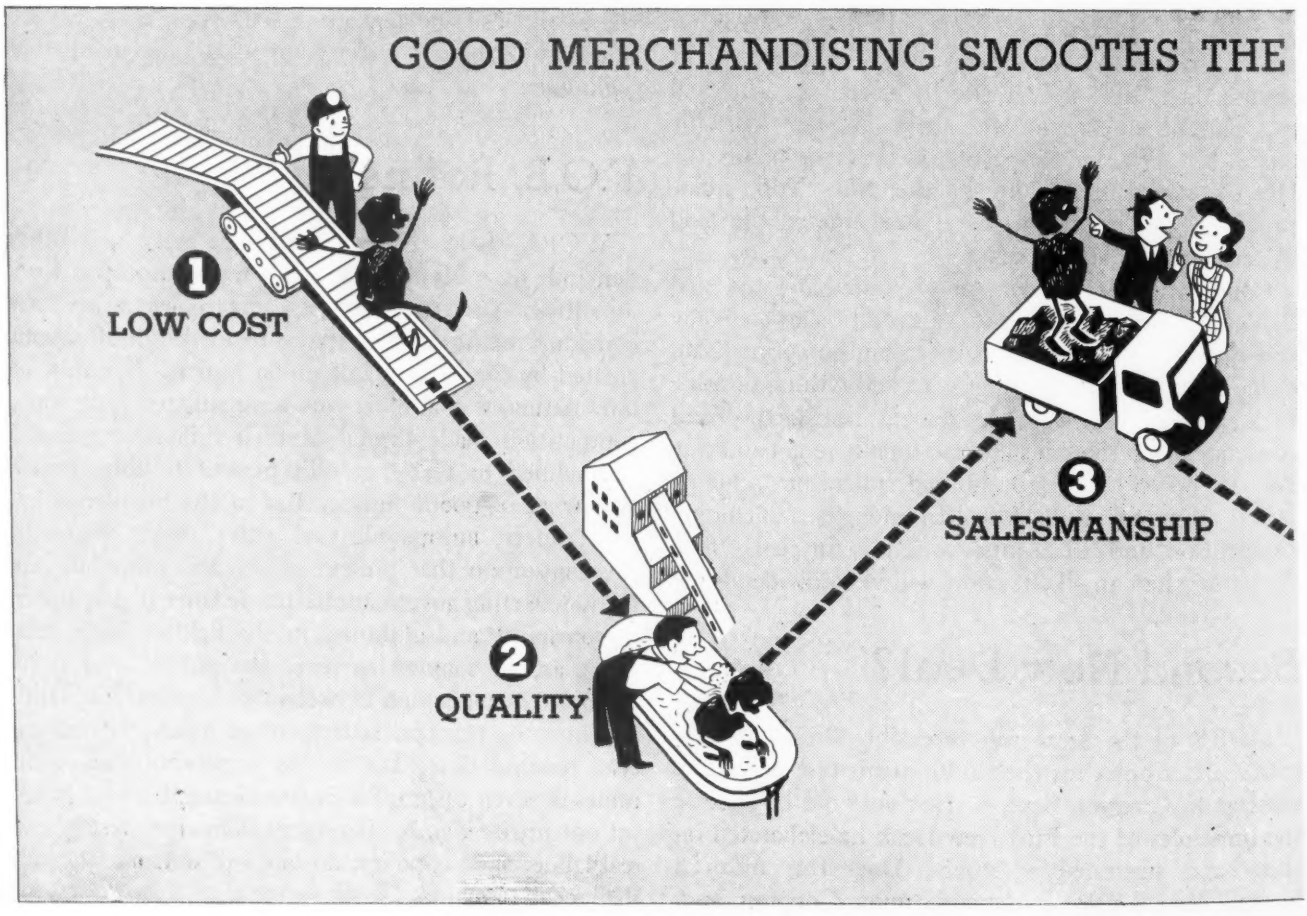
F.O.B. Refinery

WORK stoppages called to force wage and other demands have been one of coal's major problems for a long time. Now, the industry seems to have rather tony company in the field of trying to work out situations created by the demands of union leaders. It would be only natural if coal men, who have suffered long while competition made capital of their difficulties, should be inclined to feel that oil's present troubles smack somewhat of poetic justice. But in the broader sense, the refinery, automobile and other strikes highlight the contention that present policy and procedure, directly reflecting government attitude since it preempted responsibility and authority in the field of labor relations, are ill adapted to serve the public interest by promoting cooperation between management and labor and insuring peaceful settlement of issues. If nothing else, renewal of strikes by the supervisory union in mines of seven eastern States is evidence that coal is not yet out of the woods. If present difficulties result in a real labor-relations policy, no one will welcome it more than coal operators.

KEY TO MORE BUSINESS

Better

Keener competition and a buyers' market are the prospects for coal. The industry therefore must rely more heavily on its major weapon—good merchandising. What good merchandising means and how it can win and retain consumer good will are summarized in the following Coal Age study. Conclusion: The better coal's merchandising methods the more it will cash in on its opportunities.



FOR COAL:

Merchandising

MERCHANDISING might be defined as the process of bringing the possible user and the producer of a product together in a mutually satisfactory transfer of the goods in question. In other words, the objective of merchandising is a sale that leaves the purchaser happy and the seller with a reasonable profit—and also happy. If user satisfaction is secured and retained, the merchandising that created that situation also assures further sales to that same user as well as to others in his or similar classifications.

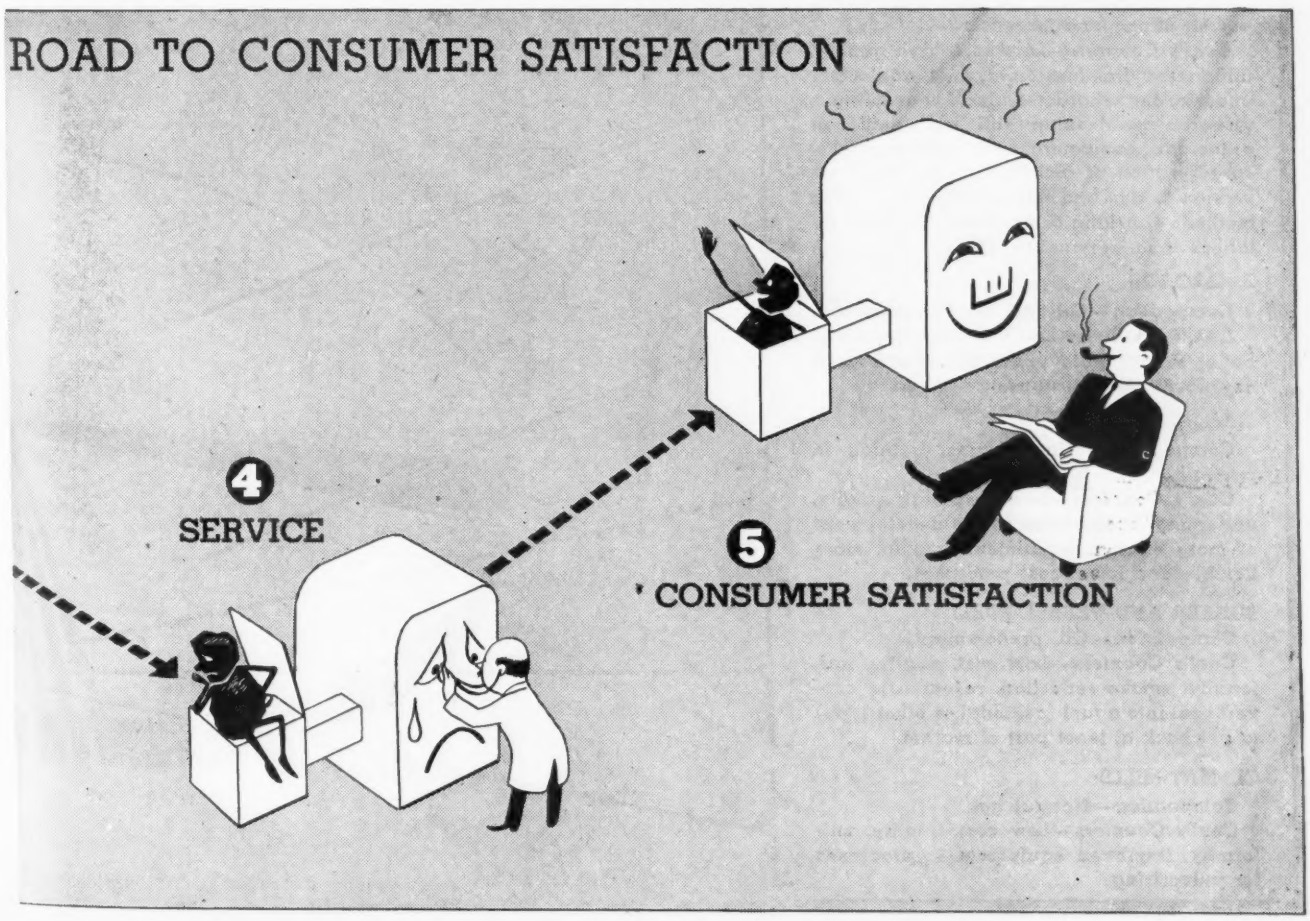
So far, merchandising admittedly has not been one of the coal industry's long suits, yet its effectiveness has a direct bearing on tonnage and the income of the miner, management down to the boss at the face and the investor who puts up the money without which production would be impossible. The coal industry undoubtedly is moving into an era when merchandising —the process of winning and holding consumer regard—will be more vital than ever. In this feature, *Coal Age* attempts to review some of the fundamentals as brought out in field discussion and independent study and from them to indicate where intensified effort might be profitable.

A start might be made by listing some of the things merchandising is and is not. To take the latter first, merchandising is not:

1. Waiting for the telephone to ring.
2. Insisting that the buyer take what the seller chooses to offer.
3. Forgetting the product when it leaves the plant.
4. Substituting fast talk for sound selling based on knowledge of the product and what it can do.

Good merchandising is not only a matter of selling as it is commonly understood. It involves production and production management, service and advertising. Among other things, it is:

1. Low price, meaning efficiency and low production cost.
2. High quality.
3. Uniformity.
4. Convenience.
5. Uninterrupted supply.
6. Active solicitation of the consumer's business.
7. Willingness to provide, within



economical limits, the product characteristics the consumer finds useful.

8. Willingness to initiate or participate in the development of more efficient burning equipment for greater consumer satisfaction.

9. Service—following the product through to final use to make sure the consumer gets the most for his dollar.

10. Research—constant study of methods of making the product cheaper, more convenient and more worth while to the purchaser.

Coal differs from many other industries where a product is developed—to meet a need or desire, naturally—and then merchandising is called upon to move it. If the possibility of processing to secure new products for which a market might be developed is eliminated, coal has the task of merchandising something already in existence and which can be modified to a relatively limited extent, although such modification can exert a big influence on certain phases of securing consumer satisfaction.

Boiled down, coal primarily is concerned with:

1. Light, heat and power market.
2. Raw material for the manufacture of other products.
3. Certain special uses, such as filtering water, soil improvement, etc.

Raw material and special application probably will be an increasingly important factor as time goes on, but for the present the light, heat and power market is the outstanding one. Coal serves this market as coal or as a source of electricity, gas or coke. Competitors, aside from wood and other fuels, are oil, natural gas and hydro power.

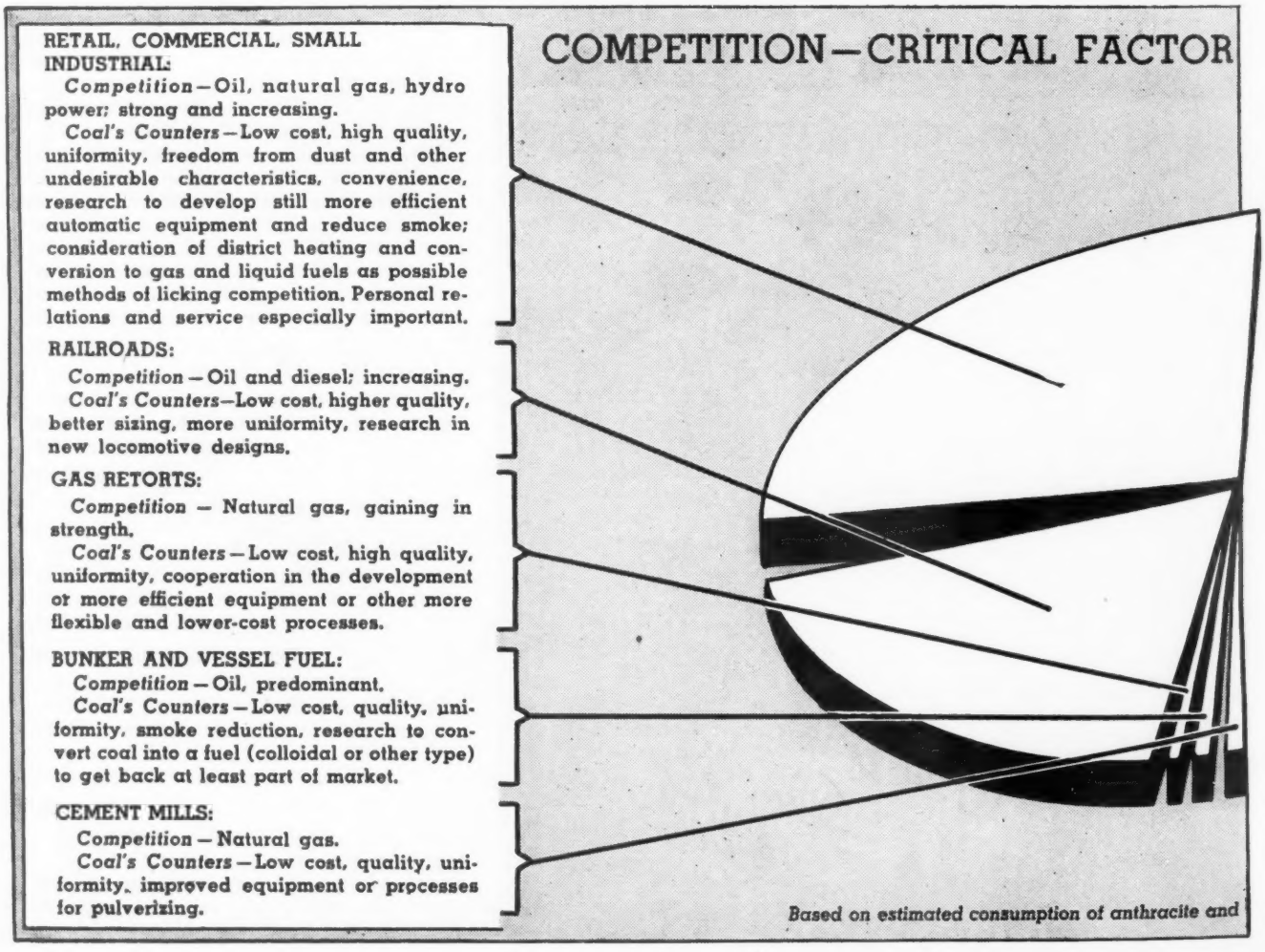
Coal reaches the consumer either directly or through various combinations of organizations, including the following:

1. Producer—consumer.
2. Producer — wholesaler — consumer.
3. Producer—retailer—consumer.
4. Producer — wholesaler — retailer—consumer.

Product, competition and the links between producer and ultimate user therefore become major elements in making a sale, making it stick and insuring repeat orders. Good merchandising gives due weight to these and other elements and combines product knowledge with low cost, quality, service and selling to achieve the desired goal—more business.

Consumer Desires vs. Product; Better Match, Easier Selling

Since the ultimate aim of any free enterprise must be winning and holding the consumer's regard, good merchandising must start with that selfsame consumer. The consumer chooses a fuel because he feels it gives him more in economy, convenience and suitability to his conditions for the money he puts out. In other words, where he has a choice, he looks at characteristics and cost in relation to his conditions and equipment and decides accordingly. No merchandiser expecting maximum results can afford, therefore, to proceed with incomplete or no information on what the customer needs or wants. With this knowledge, the merchandiser can come


COMPETITION—CRITICAL FACTOR
RETAIL, COMMERCIAL, SMALL INDUSTRIAL:
Competition—Oil, natural gas, hydro power; strong and increasing.
Coal's Counters—Low cost, high quality, uniformity, freedom from dust and other undesirable characteristics, convenience, research to develop still more efficient automatic equipment and reduce smoke; consideration of district heating and conversion to gas and liquid fuels as possible methods of licking competition. Personal relations and service especially important.
RAILROADS:
Competition—Oil and diesel; increasing.
Coal's Counters—Low cost, higher quality, better sizing, more uniformity, research in new locomotive designs.
GAS RETORTS:
Competition—Natural gas, gaining in strength.
Coal's Counters—Low cost, high quality, uniformity, cooperation in the development of more efficient equipment or other more flexible and lower-cost processes.
BUNKER AND VESSEL FUEL:
Competition—Oil, predominant.
Coal's Counters—Low cost, quality, uniformity, smoke reduction, research to convert coal into a fuel (colloidal or other type) to get back at least part of market.
CEMENT MILLS:
Competition—Natural gas.
Coal's Counters—Low cost, quality, uniformity, improved equipment or processes for pulverizing.
Based on estimated consumption of anthracite and

closer to completely satisfying the user and thereby keeping him coming back for more.

Any one or several of a number of methods may be used in finding out the customer's ideas and feelings about fuel short of assuming that because he doesn't cancel everything must be jake. One is sending a man out to visit him (or her) and check over the plant and how the customer is getting along. Another is to study and test the various types of equipment, as the anthracite industry does, to discover the best in coal size and other qualities, in addition to suggesting changes in the equipment itself to make it more efficient and satisfactory. Whatever the system employed, the more knowledge the producer has about what his customers want the better his chances of satisfying them.

Coal is in one sense just coal but in another it is a fuel that can be varied quite a bit to better satisfy a consumer's needs, desires and—even—prejudices. Knowing these accurately inevitably makes it easier to modify the coal in size, chemical characteristics and other qualities to make it more acceptable. There is much to be said for the contention of many merchandisers that coal has a lot to learn in, first, determining actual consumer needs and, second, adjusting the characteristics of that product to better meet those needs.

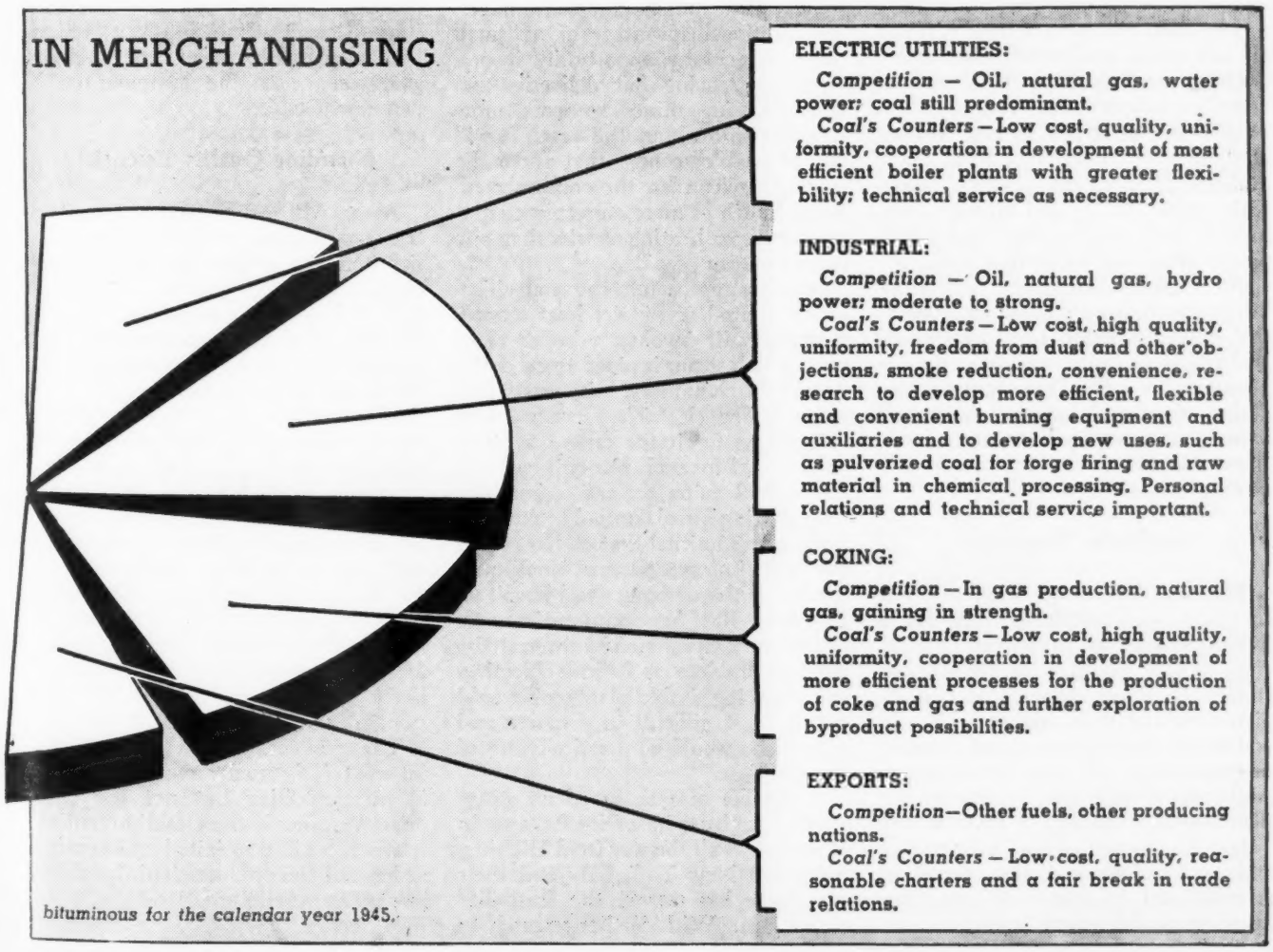
Is it size? Is it "too much rock"? Is it dust? Is it clinkering? Is it "rust"? Is it freezing? Is it water and mess? Is it lack of uniformity? All these and other questions revolve around product qualities more or less under the control of the producer and his agent or agents in distribution. To make the most of possible market opportunities, the producer must stand ready to vary his product as far as economically possible to conform to user requirements—after those requirements have been accurately determined.

But perhaps the trouble is more deep-seated. The user, as a result of what he considers bad experience, because he wants greater convenience or because he is influenced by the glamor of competition, may want more than an adjustment of his coal and supply problems. He may want to get away from coal entirely—or at least in the form in which he ordinarily knows it.

Supply already has been mentioned as one of the factors in that attitude. Experience supports the contention that it is an important one. Interruption due to strikes and other causes—mainly strikes—have been a major element in many decisions to change from coal to other fuels. If good merchandising is to have the opportunity of achieving maximum results, it must not be handicapped by frequent interruptions of operation and inability on the part of the consumer to obtain fuel when he wants it and in the volume he needs. The problem is a difficult one but the closer the coal industry can come to operating without stoppages the better chance it will have of winning and holding consumer regard.

When the customer begins making motions toward changing to another fuel and new equipment and other suggestions leave him cold, merchandising must, if possible, offer an equally or more attractive alternative or alternatives up to and including making the original product, if possible, into something else having the requisite appeal.

Cost is a factor in such conversion but within ecohomical limits the increases can be sold to the customer


IN MERCHANDISING
ELECTRIC UTILITIES:
Competition — Oil, natural gas, water power; coal still predominant.
Coal's Counters — Low cost, quality, uniformity, cooperation in development of most efficient boiler plants with greater flexibility; technical service as necessary.
INDUSTRIAL:
Competition — Oil, natural gas, hydro power; moderate to strong.
Coal's Counters — Low cost, high quality, uniformity, freedom from dust and other objections, smoke reduction, convenience, research to develop more efficient, flexible and convenient burning equipment and auxiliaries and to develop new uses, such as pulverized coal for forge firing and raw material in chemical processing. Personal relations and technical service important.
COKING:
Competition — In gas production, natural gas, gaining in strength.
Coal's Counters — Low cost, high quality, uniformity, cooperation in development of more efficient processes for the production of coke and gas and further exploration of byproduct possibilities.
EXPORTS:
Competition — Other fuels, other producing nations.
Coal's Counters — Low cost, quality, reasonable charters and a fair break in trade relations.

bituminous for the calendar year 1945.

by stressing the extra advantages he gets for his money. At least, that is the approach of competition. For the hard cases, therefore, good merchandising does not dismiss the possibility of converting coal into a liquid or a gas, in addition to electricity. Good merchandising always assumes that there is more than one way to skin a cat and that if one doesn't work there should be no hesitation in changing to another until the best is found.

While converting coal to another form of fuel is, as just intimated, one shot in the locker of merchandising, the real factor may not be coal's characteristics at all. Instead, it may be—and frequently is—the equipment used for storing, feeding and burning the coal and handling and disposing of the ashes. The mind goes to hand-fired furnaces vs. the modern automatic bin-fed household heaters with improved ash-disposal facilities or the hand-fired boiler plant compared to modern stoker-fired units with high flexibility in coal used and modern coal- and ash-handling equipment.

The kitchen stove, the parlor heater, the hot-water unit are examples of coal burners often passed over rather quickly. Nevertheless, a lot of business is wrapped up in these and similar equipment and improved units have proved their ability to attract purchasers and retain and expand markets.

Good merchandising therefore concerns itself with seeing that the best of any and all types of coal-burning equipment is developed and made available to users and potential users. This extends on up and through commercial and large power equipment, where attention to getting good designs, capacity, efficiency and flexibility may mean a chance at business that otherwise might be lost or which coal might not otherwise have an opportunity to gain. Developing a new design of railroad locomotive actually is merchandising in the real sense of the word, since it is a step toward promoting coal sales.

Auxiliaries Important

Even the best of equipment may not be able to yield maximum results if it is handicapped by inadequate auxiliaries—a bad chimney or stack, poor storage facilities, awkward and inefficient ash handling and the like, in addition to operation without cleaning of gas passages and poor maintenance. Ability to provide good advice on the planning of all phases of plant layout—home, commercial and industrial—and on efficient operation therefore is additional insurance of consumer satisfaction and repeat orders.

Attainment of the objectives contemplated in changing the form of coal, which includes the vital one of elimination of smoke, also is possible without such conversion. Among the means available are:

1. Heating service.
2. District heating.

Now receiving a new trial in various quarters, "heating service," so called, offers what many, including a number of anthracite producers, feel are real advantages in overcoming difficult merchandising problems. Heating service takes various forms, but interest mainly centers in plans whereby the coal industry, including retail outlets, takes over the complete responsibility for keeping the client and his family warm through the installation of automatic heating equipment, delivery of coal, removal of ashes, maintenance of equipment and rendering of any other necessary service.

Paying Made Painless

Hooked up with a plan for regular monthly payments, such heating-service plans relieve the consumer of all labor and attention in connection with providing heat and makes paying for it more systematic and painless, to cite some of the outstanding advantages. An additional advantage of no small magnitude is the opportunity it provides for spacing out deliveries and thus enabling mines to work more regularly throughout the year. It will be observed, of course, that under the heating-service plan the consumer enjoys as much or more convenience and freedom from heating worries than any other fuel can provide.

Another approach to the same objective is central or district heat service. Essentially, it involves a boiler plant from which steam is piped to an entire district or community with customers using it like electricity, gas or water and paying for it the same way. The natural fuel for such plants is coal and it is difficult to foresee any competitive fuels getting a real foothold, although it must be admitted that oil has gotten the nod in one or two small new towns—perhaps because coal wasn't on the job. But in communities over 30,000, now envisioned by those studying the problem as logical objectives and requiring sizable plants, oil would find it most difficult to compete and natural gas would be practically out of the question.

A number of such merchant steam plants have been in service for years in communities all the way from Hibbing, Minn., to New York City and their experience has proved the feasibility of the idea. With further research to diversify the load, which might well include snow removal in the winter by melting it, the possibilities should be even more attractive. Economy, service through turning a valve and payment by meter reading or flat monthly charge are big arguments for such plants.

Gasification, liquefaction, heating service and district heating, it is true, would exert a substantial influence on sizing and consequently might force a change from pricing on the basis of pounds of material to one of energy in the form of B.t.u. If the net effect were more business for coal, however, it seems evident that the question of size-price relationship would not be unduly hard to answer.

Research already has appeared a few times in this discussion and there is no doubt of its being a potent merchandising tool. Research shows how the product can be improved and matched better to the needs of the consumer. It provides the information on which to build new markets. It develops equipment for using coal more efficiently, economically and conveniently. In its broadest sense, it also provides data on consumer needs and desires, on where the merchandising effort will yield the maximum dividends and on methods of telling the story of coal's advantages in a fashion best calculated to achieve the ultimate goal—service to the customer on a permanent basis.

Guarding Quality Essential

Along with other factors, guarding the quality of the product is an essential item in getting maximum merchandising results. As the coal industry well knows, one of the sources of a lot of its troubles are complaints about variations in quality and performance. These are rooted in production practices and control methods at the mine. Along with other mining and preparation practices designed to minimize variations in quality should go continual checking of physical and chemical characteristics during preparation and prior to shipment. In other words, the laboratory should be the watchdog of quality and uniformity. Without it, the merchandiser is operating under a handicap and variations in quality are likely to rouse and perpetuate consumer dissatisfaction.

The product, how it is used and in what it is used are major phases in merchandising but not the only ones. Another is the establishment of relations leading to initial and continued use of the product. This involves, in perhaps reverse order:

1. Service.

Building Friendly Relations: No. 1 Goal for Entire Industry

2. Advertising in its many forms.
3. Friendly, helpful and satisfying personal contacts.

Preventing the squawks or, if they occur in spite of preventive measures, quieting them and leaving the customer even better sold than before is a necessary—and vital—element in merchandising. In a broader and perhaps more dignified manner of speaking, good service is an essential part of good merchandising. Such service insures, among other things:

For Lasting Satisfaction

1. That coal and plant—whether home, commercial or industrial—are matched to provide the maximum in economy and satisfaction.
2. That users are kept apprised of the latest and best in equipment and methods of burning coal and are assisted in putting them into effect.
3. That trouble is remedied promptly and cheerfully at a minimum cost to the customer.

As envisioned by many operators, service requires a special organization of trained supervisors and field workers who know coal and equipment. For that reason some suggest that coal might well consider a "technical-relations" organization on the same order as its public-relations and research organizations, since it might be difficult for individual concerns to do the job contemplated. The fact that service pays off has been recognized in the increased employment of fuel and combustion engineers by coal producers. Expansion of the principle to something approaching that rendered by competitors consequently is a logical step for coal.

Outstanding merchandisers, such as the automobile, soap and tobacco companies, to name but a few, never let the sun go down without the public reading and hearing about their product and how it will make their lives happier. Perhaps some might say that coal and automobiles are not particularly comparable but voluminous experience has proved that studying the product to discover its every advantage, preparing the most carefully thought-out and appealing story of those advantages and then telling it over and over in every way—through the newspapers, magazines and radio, on billboards, directly through the mail and even written across the sky in smoke—yield real results in attracting interest and promoting sales.

Industry campaigns supplemented by individual and local cooperation have been advocated for years by many operators. Anthracite has gone farthest in that direction and for an industry like coal, made up of a large number of individual concerns, there is much to be said for a general program to key the work and prepare the ground for strong support and sharpshooting by sectional organizations and individuals. As a potent tool in business getting, advertising, used to its fullest, is an integral part of any good merchandising program.

Creation of confidence and friendship naturally are the major objectives of service and advertising. They reinforce and are reinforced by how the more personal relationships between representatives of the producer or his agent and the customer are handled. All coal men know of numerous instances where personal friendship between the salesman and his customers has carried with it a substantial volume of business year after year. Naturally, the salesman has a good product and knows his customers' needs. On the other hand, all coal men know of plenty of business that was lost because the industry's representatives were uninformed, unprogressive and inclined to operate on a take-it-or-leave-it basis.

No attempt will be made here to write the specifications for a coal salesman but it is logical that he should possess in the highest degree the quality of making friends for his product through knowledge of what it is and what it can do. Above all, he should believe in coal and evidence that belief by refusing to make a price cut his sole sales argument. Good, well-trained salesmen and service representatives, backed up by a good merchandising organization and supporting advertising, can do a real job in winning for the product the confidence of the user.

Because, in the long run, sales are transactions between people even if, as in some cases, much of the personal element is taken out of it by specification buying, the need for representatives who can create confidence and good will takes on added importance. That applies to agents of the producer as well as to men on his own payroll. Selection of these agents—wholesalers and retailers—and supporting them after they are selected becomes every bit as vital as selection and backing of the men who draw their pay directly from the producer.

More specifically, the retailer is the producer's only contact with a large segment of his business. Consequently, how well the retailer discharges his merchandising responsibilities, including service, is reflected in how well the producer fares in retaining the respect and confidence of the user, even though he may be doing advertising and other promotional work.

In the long run, the producer has an obligation to the retailer, the retailer has an obligation to the producer and both have a much greater obligation in rendering maximum service to the consumer. The same thing applies when relations between producers and wholesalers or wholesalers and retailers are in question. The producer should make every possible effort to choose retailers who are alert and anxious to do a real job in serving the consumer and promoting the use of coal. After that it is logical that the producer work with the retailer to help him do a better job, including backing him up with advertising, technical advice and service plus any other assistance that may be necessary. In turn, the retailer should keep alert and abreast of modern merchandising methods, cooperate with his producer and do everything else he can to keep his customers happy and coming back for more.

Work and Achieve Together

There is every reason for the closest relationship and mutual effort on the part of producer and dealer since they both have a vital stake in the maintenance and expansion of coal sales. The numerous profitable producer-dealer set-ups now in existence are evidence that the two parties can work and achieve together. There is no reason why the remainder cannot be made so and to get the most out of the industry's merchandising efforts it is logical that they should.

Like everything else, getting results in merchandising involves, first, a thorough understanding of the problem and, second, decisive action on those findings. Study of the situation shows a need for both industry-wide cooperation in some phases and intensified individual effort in others. Good merchandising has shown that it can pay dividends in other industries. There is no reason to believe that the situation is any different in coal.

MACHINE LOADING

Taking Top and Coal Raises Entry Output

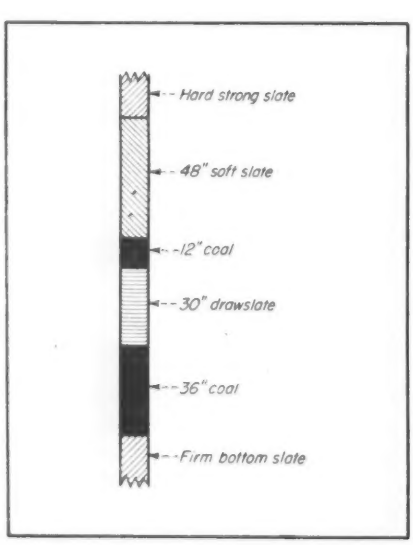
Taking Top Material in Addition to the Coal With Loading Machines Raises Output per Man in Entry Driving Over Development With Drawslate Held — Coarser, Cleaner Product Favors Conveyors in Room Work

By J. H. EDWARDS
Associate Editor, Coal Age

Entry driving showing loading of coal from under the ledge of drawslate.

DARBY NO. 1 MINE of the Peerless Darby Coal Co., Splint, Harlan County, Ky., has worked out a cycle of development work with mobile loaders, taking 36 in. of coal plus 42 in. of waste material, under which the coal tonnage per manshift is 5.6 percent greater than in room work, where hand loading onto conveyors is the practice with the waste material held up. Another accomplishment is the system of "forepole" timbering at the face of the 65-ft. rooms whereby comparative safety has been achieved in handling a frail and uncertain roof under heavy cover. This mine won both the "War Production Efficiency" and "Victory Production" awards offered by *Coal Age* for 1944 performance.

The operation is in the Darby seam, which yields a premium domestic and byproduct coal. This seam outcrops 400 ft. above the tipple railroad tracks and lies nearly level. The location, 13 miles from Harlan and on the Poor Fork Branch of the Louisville & Nashville R.R., which serves Lynch mines, is near the extensive Pine Mountain fault, or "want," which geological fact is thought to account for breaks in the main roof which lead to uncertain actions. As explained by Fred Hubbard, superintendent, the main top may look fine in the workings but "it goes bad back of you and the slips may cause a roof that looked strong to go bad and fall overnight."



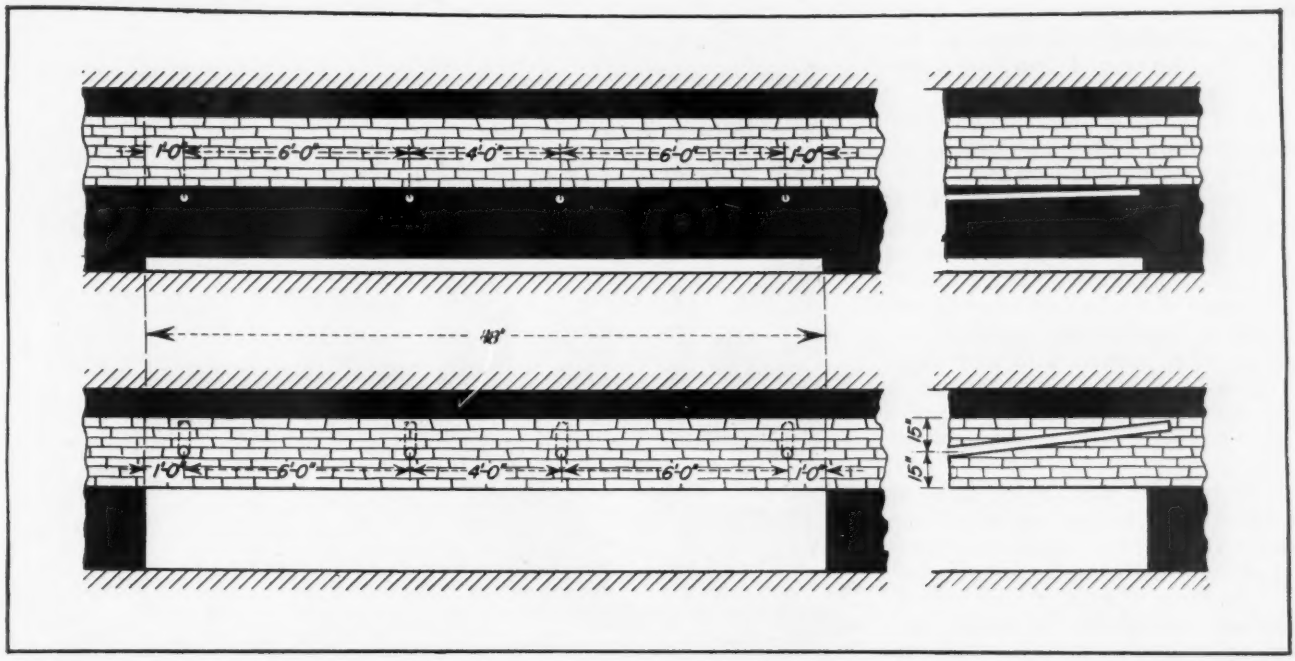
Darby seam at Splint, Harlan County, Ky.

Top Coal Discarded

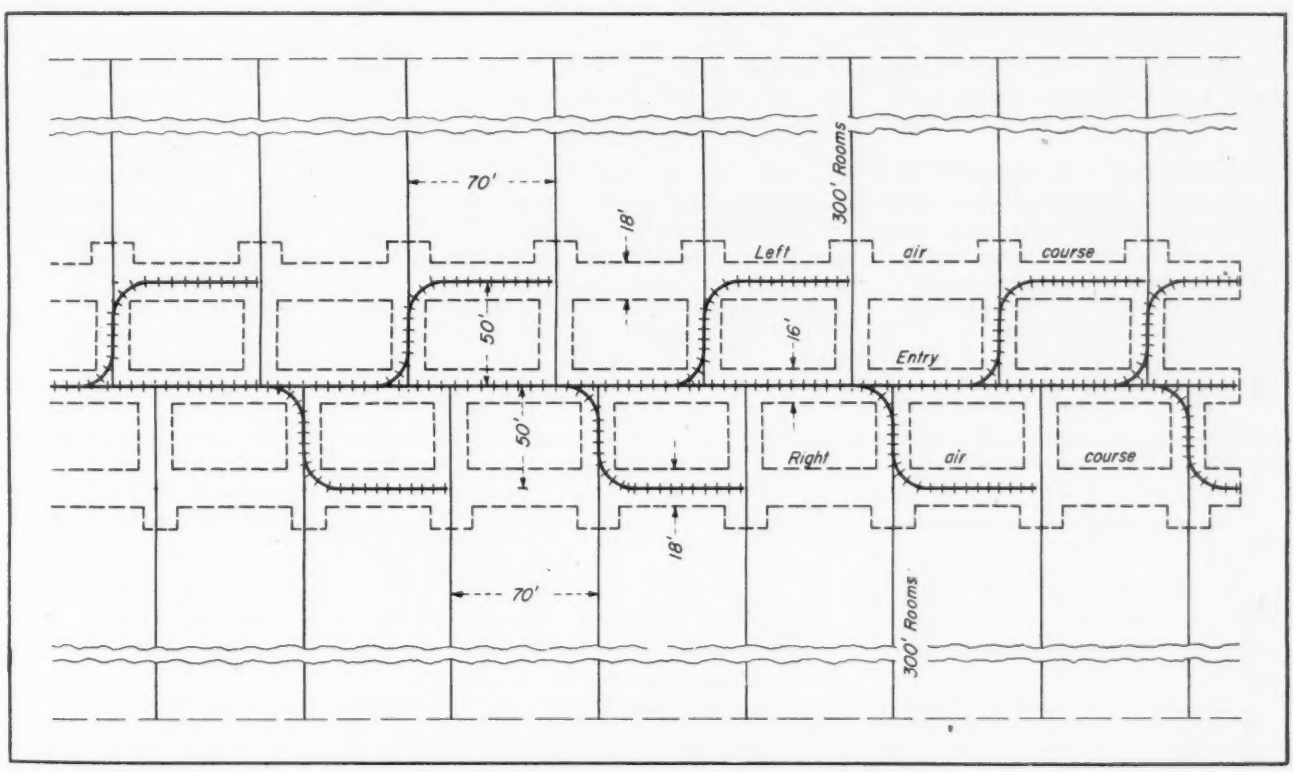
Topping the coal is 30 in. of drawslate and 12 in. of weak top coal which is not saved, then 4 ft. of soft shale. Next above that (9½ ft. from the bottom) is a hard slate which makes a good roof, assuming there are no slips. Overburden runs up to 1,200 ft. Bottom is a firm slate. Explosive gas is not present in quantities to be detected on a flame safety lamp and there is practically no influx of water. That is the picture.

The present operators, Roland C. Luther, president, and E. C. Luther Jr., general manager, both of Vivian, W. Va., took over the mine from the Splint Coal Corp. in 1942, realizing full well that some radical changes would have to be made in underground methods to cope with the adverse natural conditions. The existing aerial tramway and tipple, maximum capacity 100 tons per hour, have been continued in use. This tram, a gravity type with two 1¼-ton buckets, is 1,300 ft. long down the mountainside. Fortunately, the mine was already equipped with steel drop-bottom mine cars, 42-in. gage, and a 70-ton dump hopper at the headhouse.

The cars, considerably smaller than the present operators would choose, have been equipped with side boards



Shooting pattern for entry development with loading machine. How the coal is brought down is shown in the upper view; draw-slate and top coal, lower view.



Plan of development for cross or room entries. When driven with the loading machine the main track is in the center heading and the tracks in the two aircourses are picked up every other crosscut. When room work is started a mother conveyor is installed in the center heading. Main entries are driven on the same plan.

and now average 2.3 tons of coal when loaded with the Joy machine and 2.65 tons when loaded by conveyors. Draw-slate disposal, which could be a serious matter at this mine, is only a minor item because of the drop-bottom cars and favorable terrain along the ½-mile outside haul to the headhouse. From a dumping point constructed inexpensively under a 10-ft. section of the tramway track the refuse slides on steel plates to the final resting place. Each dumping point will last two or three years.

Three headings 18 ft. wide on 50-ft. centers and driven by the loading machine constitute the main, cross and room entries. For room work a mother chain conveyor, maximum length 355 ft., is installed in the center heading. Rooms are driven on 70-ft. centers and the plan, seldom achieved in full because of the variable roof conditions, calls for four room conveyors, two on each side, delivering to the one mother conveyor.

Crosscuts are opposite the room

necks and top is taken in them, thus giving headroom for haulage, for the conveyor drives and handling materials.

In the entry driving the Joy loads directly into the mine cars and changing is done with one Goodman cable-reel locomotive. Maximum travel for a car change is 140 ft., as the tracks in the two side headings or aircourses are picked up every other crosscut. Timbering of the haulage heading and aircourses consists of 4x8-in.x12-ft. collars on 4½-ft. centers with post clearances of 24 in. to the sides of the mine cars. Center lines are carried over the rail to provide space for gobbing drawslate.

Ten men comprise a Joy crew, as follows: one loader operator, one loader helper, two preparation men (track and timbering), one shotfireman, two men forming a crew for cutting and drilling, one motorman, one brakeman and one foreman. The cutting is done with a Jeffrey 35B with 7½-ft. cutter bar fitted with Bowdil chain and bits which make a 5-in. kerf. Chains and bits making a 4-in. kerf have been tried but are not favored because the coal does not shoot so well with the smaller space. Drilling is done with a C-P No. 572 electric drill.

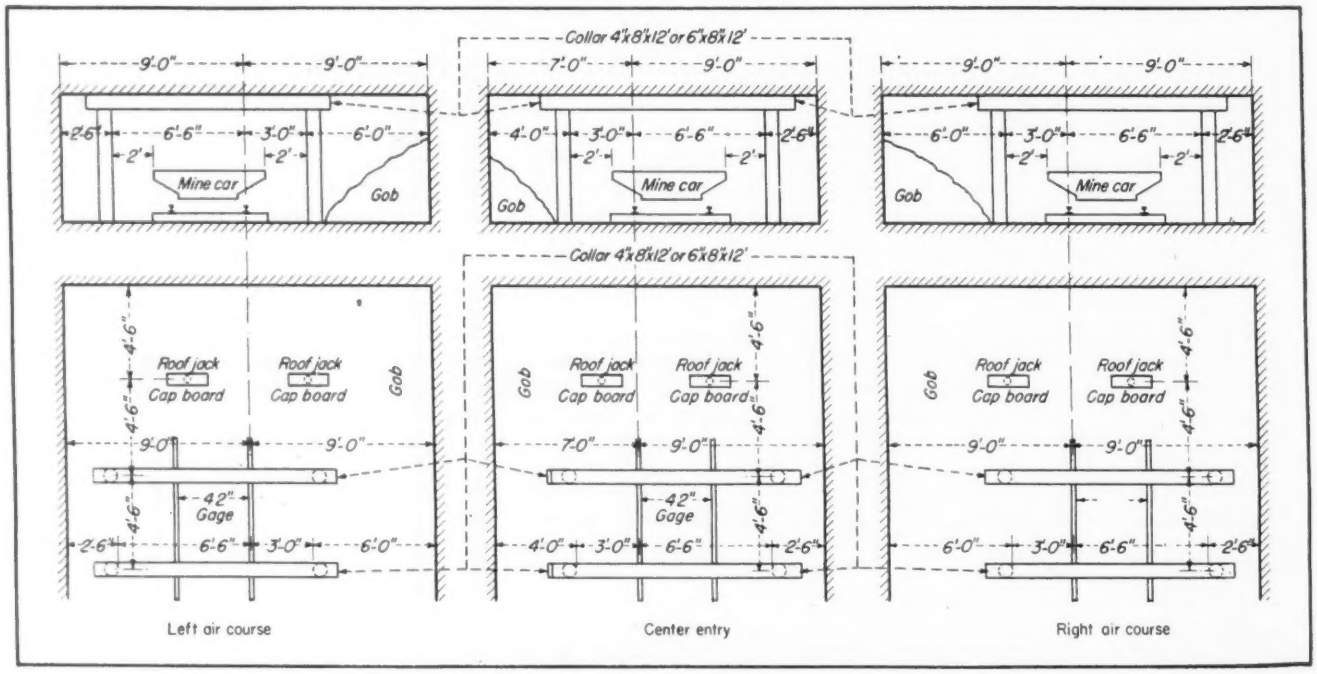
The following is an outline of the cycle that has been worked out so that waiting is kept to a minimum. The starting point is a cleaned-up heading face; that is, when the loading machine is leaving the face after having loaded the drawslate and top coal.

First two timber men come into the place and set 4x8-in.x12-ft. collars and posts on 4½-ft. centers, with the last collar not more than 6 ft. from the face. Usually they set two collars but sometimes only one is required.

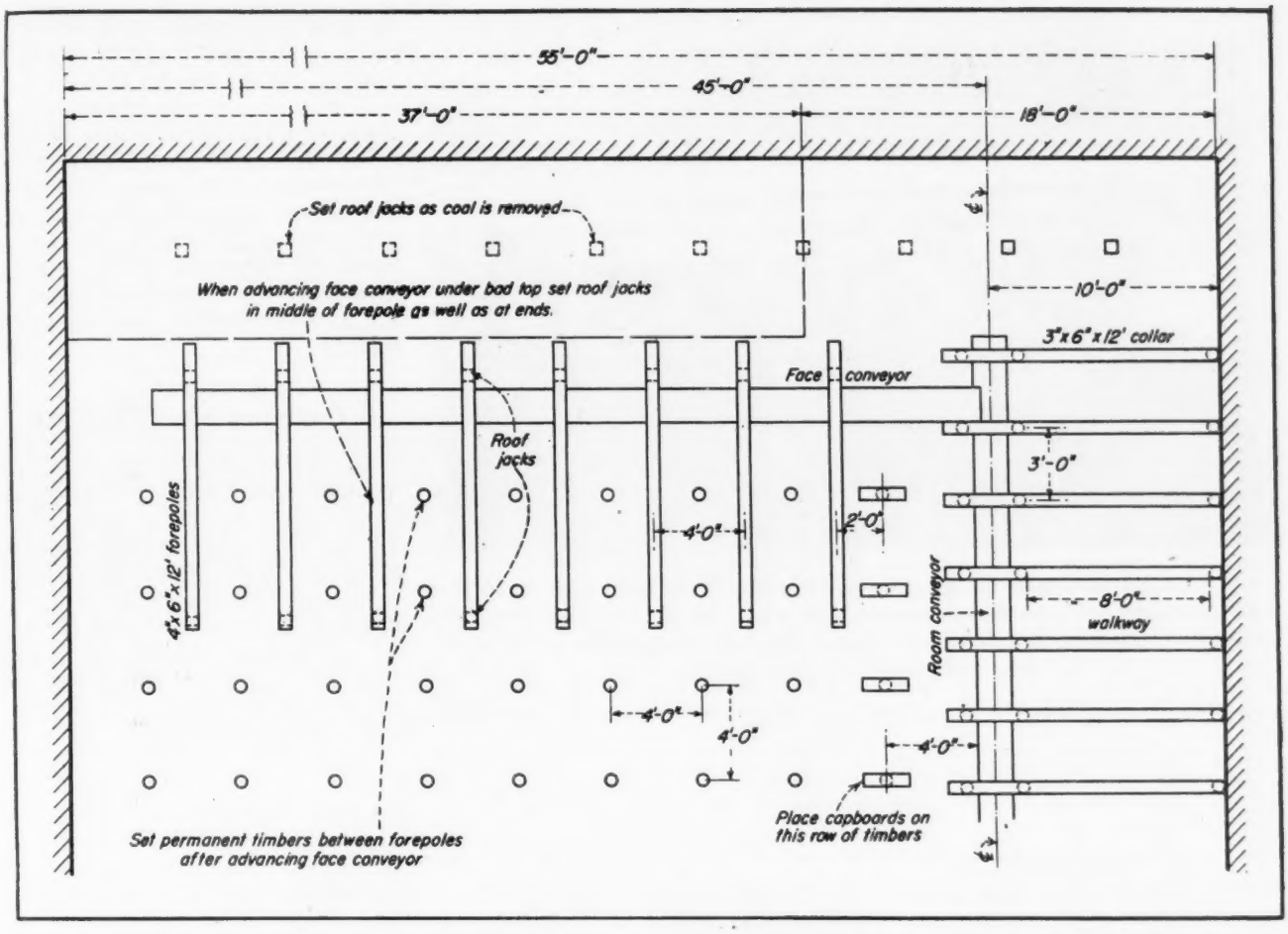
A supply of collars, the room conveyor and 14-in. tubing are visible at the room neck.

The two machine and drill men then undercut the coal and drill the coal and drawslate. Holes in the coal are positioned to bed the charge up against the drawslate and those in the drawslate are started near the center of the stratum and angled up to bed the explosive against the bottom of the top coal.

While the cutting and drilling are going on the two preparation men lay the track. Next the shotfireman enters the place, bug-dusts the cuts, loads the coal holes and shoots down the coal. The Joy machine enters and while it is loading the coal the shotfireman assists the preparation men on track and timber work in another working place. When loading of the coal is completed and the machine is backed to a safe distance the Joy crew assists the shotfireman in loading holes and shooting the drawslate. The top coal comes down with the slate. As soon as the



Standard timbering for entries calls for collars placed on 4½-ft. centers.



Standard room timbering. At this stage in the cycle the face conveyor is advanced, the 37-ft. main face is loaded and the 18-ft. step is ready to be drilled and shot.

smoke clears the Joy is moved back and completes the cycle by loading the drawslate and top coal.

At least 70 percent of the refuse, consisting of drawslate and coal, is hauled outside to a hillside dump. The remainder is gobbed along the ribs by the loading machine. Explosive used in the coal is Atlas T-1 Coalite, 1½ sticks in each two center breaker holes and two sticks in each rib hole. In the drawslate Atlas Gelcolite is used and two sticks are loaded into each of the three holes.

Performance is fairly consistent, for, as explained previously, the roof troubles usually occur outby the face. Curiously, however, performance is not up to par as a rule where the drawslate is thinner than normal. Then some of it comes down with the coal and a cleaning job at the face is necessary.

Rooms, taking the 36 in. of coal only and holding the drawslate in place, are worked the full width of 55 ft. on the advance, hand loading onto a chain-type face conveyor 42 ft. long and using a chain-type room conveyor 300 ft. long (both Vulcan Iron Works units). Rooms are driven 250 ft. deep measured from the outside rib of the adjacent aircourse. Width of room necks is 25 ft. and widening to 55 ft. takes place at the rate of 5 ft. per cut. Cutting is done with the same type of shortwall, same length of bars, same chain and bits as used in entries. Drills are Type 571 C-P, which are lighter and have a lower rating than those used in entries. Room blowers are of two types, Brown-Fayro and Jeffrey Aerodyne Midget. With these blowers 14-in. du Pont Ventube is used. Car spotting is done with a Brown-Fayro hoist.

In Two Steps

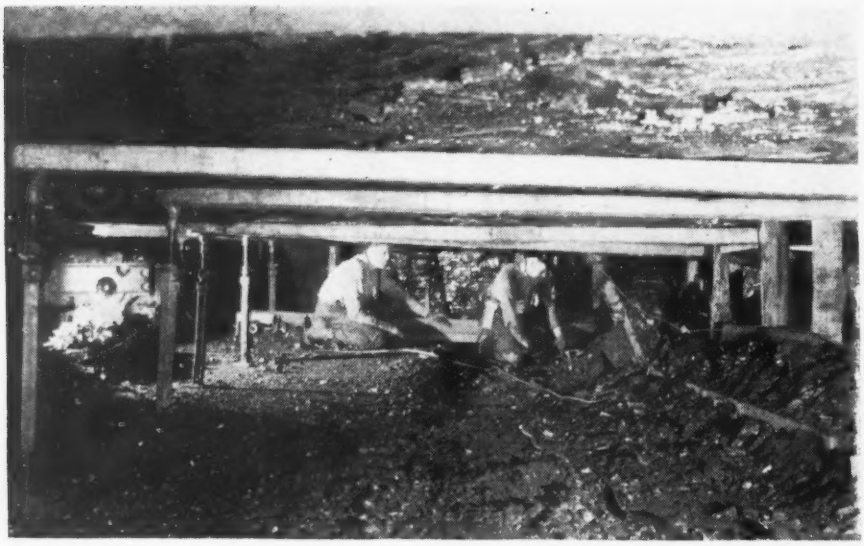
Rooms are driven in two steps. An 18-ft. width directly ahead of the room conveyor is cut and loaded one step ahead of the remaining 37-ft. face. This 18-ft. place is locally termed the "step." In this article the 37-ft. width will be termed the "main face."

The room conveyor is positioned 10 ft. from the rib. Permanent timbering of the 18-ft. step section in the room consists of 3x6-in.x12-ft. wood collars on 3-ft. centers and one row of room posts with 24-in. caps. Two posts, one on each side of the room conveyor, support one end of the collar and a third post supports the other end. An 8-ft. clearance between the collar post next the conveyor and the collar post on the right-hand rib provides a well-protected crawlway to the pan line. Permanent posting in the remainder of the room consists of posts on 4-ft. centers both ways and not staggered.

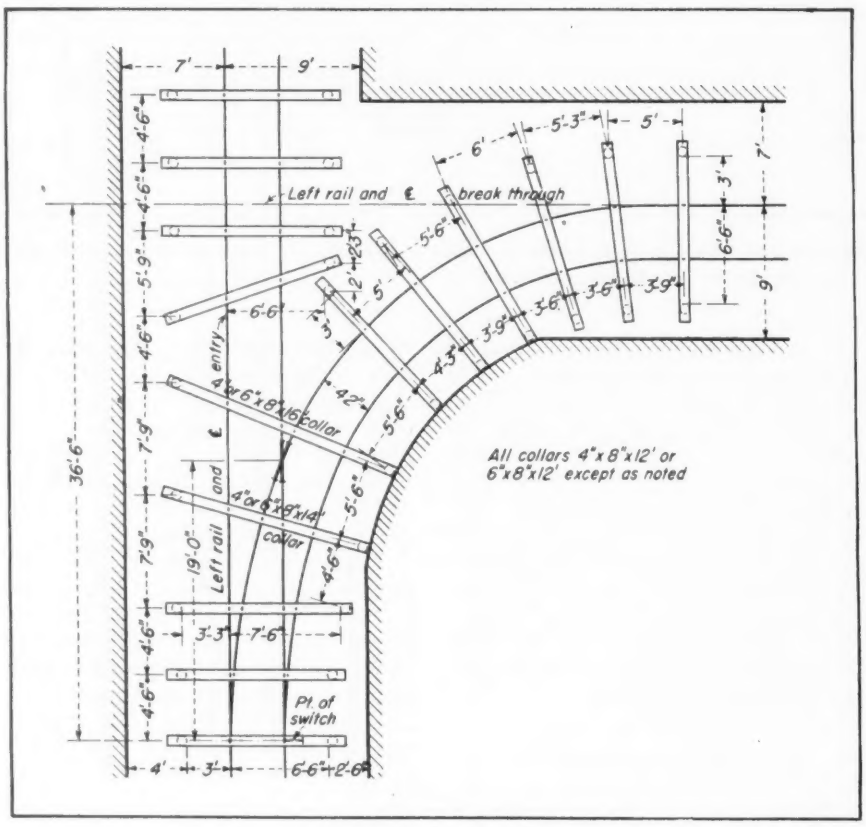
Temporary timbering of the main face consists of 4x6-in.x12-ft. collars set parallel to the room center line and locally termed "forepoles." These are on 4-ft. centers and are moved forward each cut so that the ends are against the face, thus giving the cutting-machine men "forepole" protection along the main face. Duff-Norton jacks support the forepoles and are used as safety posts ahead.

Drilling pattern and explosive charge in the "steps" are the same as for shooting the coal in the entry headings. On the main face five holes are drilled and the charge of Atlas Coalite is 1½ sticks per hole.

Six men comprise the standard crew in room work. Here also the cycle of work is arranged so that there is no waiting. It is as follows, starting where the 37-ft. main face has been shot down and the cutter is beginning to sump in at the room-line rib of the



In a 55-ft. room, looking from the tail of the face conveyor (right) toward the tail section of the room conveyor. The cutting machine is at the left in the 18-ft. step. Men are hooking cutting-machine feed cable to the drive of the face conveyor to pull it forward. Steel jacks support the "forepoles."



Timbering at a turnout.

step, which is already one cut ahead of the main face:

While four men load out the coal on the main face the machine man and helper cut, bug-dust and drill the 18-ft. step. When the four men have loaded out all of the coal on the main face the conveyors are stopped and those four men advance the forepoles and take out the safety jacks and timbers. At the same time the two machine men add a section of pan and chain to the room conveyor, load the step holes and shoot that coal.

Next, while three loaders shovel the step coal onto the end of the room conveyor the mining-machine crew cuts and drills the main face. One loader follows the cutting machine across the face setting steel jacks under the ends of the forepoles at the coal face. He also bug-dusts the cut. By the time these operations on the main face are completed the three men have finished loading the step coal.

The entire crew then moves the face conveyor up to the face and sets the gob timbers (permanent posts) behind the conveyor. The main face is then shot down and a repetition of the cycle begins. No collars or posts are recovered when the room is abandoned, it being impossible because of the excessive weight and danger involved.

Conveyors Move Supplies

Materials for both development and room work are distributed by a night supply crew. By reversing the chain conveyors they transport the collars, posts, etc., to the room faces.

Underground power is 275 volts d.c. and the room cables (No. 2 duplex) are sectionalized in 100-ft. lengths using Ohio Brass locked connectors. Safety junction boxes at the face are of the same make.

Capacity of the operation is 650 tons per day based on two full shifts. Shortage of men and considerable absenteeism, however, do not allow running two full shifts; consequently the average tonnage per day is 400. This comes from the Joy section, working two shifts, and the conveyor section, working one shift.

Since the mobile-loader section produces coal consistently more cheaply than the conveyor section, full consideration has been given to changeover to complete mobile-loading equipment. However, it has been found the conveyor coal contains such a greater percentage of larger premium sizes of domestic coal and so much less impurities than does the mobile-loader section that the final cost of operation, considering realization as well as production cost, is better than the mechanically loaded coal.

Greater value of the mobile loading unit in this seam is found mainly in the fact that it is the fastest and most economical method of driving entries where it is necessary to handle such a large quantity of rock. Here the volume of the waste material exceeds the coal and the weight is nearly double the coal weight. Because of very bad roof conditions which frequently make certain areas unminable, speed is essential. Therefore, the loading machine has been the answer to this need, and the combination of these two types of equipment has enabled the company to produce coal economically despite difficult natural conditions.

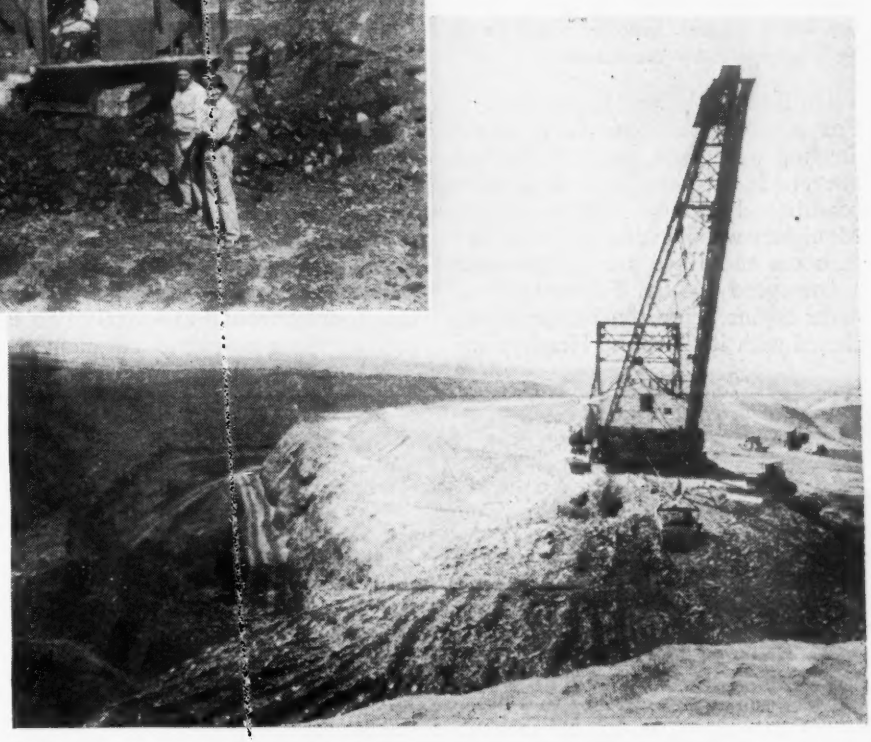
Robinson & Robinson, engineers, Charleston, W. Va., serve the company in an advisory capacity.

STRIPPING IMPROVEMENTS

Mark Rimersburg Expansion Program

Stripping Range Increased and Rehandling of Spoil Eliminated by Purchase of 10-Cu.Yd. Dragline — Machinery on Ground Foundations Features Tipple Serving New Pits—Well Casing Used for Drainage

Gasoline shovel with 1-yd. bucket loading parts of the second and third cuts in No. 1 pit, Bradys Bend. Here the overburden is not shot and only in a few spots is it necessary to shoot the coal, even though the overburden is not shot. In the foreground stand Gerald L. Streuter (left), pit foreman, and N. E. Bourgeois, assistant superintendent.

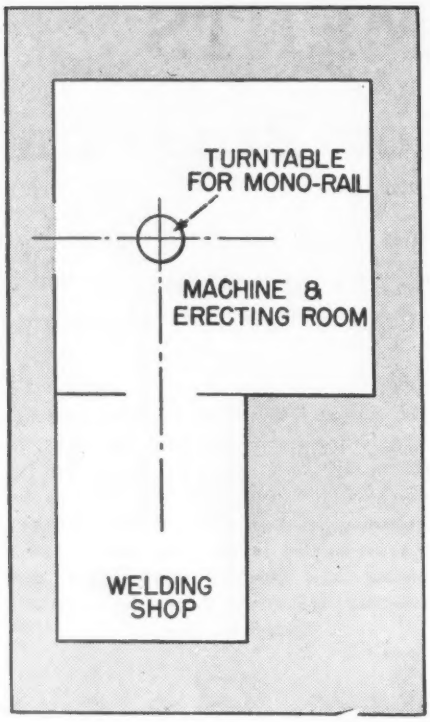


Dragline at one end of the pit and taking 12 ft. of topsoil.

INSTALLATION of a large dragline to handle deeper cover has increased by four or five years the projected life of Fox mine of the Rimersburg Coal Co., Rimersburg, Pa. When operations began in 1941 the life expectancy was ten years. Now, after having produced around 800,000 tons, the life expectancy still is ten years. The company has erected a second tipple which is of unusual design and serves three new pits and also has built a central repair shop, purchased a number of trucks and hit on a new scheme for pit drainage.

Fox mine recovers the Lower Freeport, or "E," seam in Clarion County, Pennsylvania, about 75 miles northeast of Pittsburgh. Coal thickness is 40 in. and the terrain is rolling to the extent that 45 ft. of cover, which was the limit until a new dragline was installed, opened widths of 200 to 400 ft. There are, however, a few flat areas as large as 25 to 30 acres with cover not exceeding 45 ft. About 290 acres running 6,000 tons per acre remain to be stripped. As explained in a previous article describing the new Fox mine (*Coal Age*, June, 1943, p. 73), the company was organized by interests new in coal mining but having a respect for the virtues of good equipment properly maintained.

R. E. Crane, a manufacturer of plumbing equipment at Ford City, Pa., is president; Radford R. Crane is vice president; Jeanne M. Crane, secretary; C. W. Corbett, general manager; L. W. Rennaker, superintendent, and N. E. Bourgeois, assistant superintendent. Annual tonnages shipped, 1941 to 1944 inclusive, have been as follows: 21,233; 233,000; 261,000 and 281.000.



The new shop has been equipped with a monorail crane, 5-ton electric hoist and machine tools so that all equipment, including diesel engines, henceforth will be repaired by the company.

Until recently the largest unit at Fox mine was a Lima 1201 crawler dragline with 75-ft. boom and 3½-yd. bucket. It has been replaced by a reconditioned Model 6160 Bucyrus Monighan walking dragline with 165-ft. boom and 10-yd. bucket driven by a slow-speed 375-hp. Fairbanks-Morse diesel engine. Three buckets were purchased with it. Two are Hendryx and one is a Page. All three have plain steel body with manganese lips and manganese pulling hitches.

Other equipment at Fox mine is: loading shovel, Lorain No. 79, 1½-yd., 22-ft. boom, 24-ft. stick with Caterpillar D-13000 diesel engine; one Caterpillar D-4 tractor with dozer for cleaning the top of the coal and making roadway; one Allis-Chalmers HD14 tractor with Baker Gradebuilder for leveling ahead of the walking dragline and for stripping in conjuction with it; one International Model 1-A tractor with Hough broom for cleaning the top of the coal; one Galion grader for road making; four Jaeger gasoline pumps (two 3-in. and two 4-in.) and one Parmanco vertical overburden drill.

Shooting Changed

Overburden handled in the first few years of operation contained 12 to 15 ft. of blue shale above the coal, and this was dug without shooting. During that period the coal had to be shot. Now, with deeper stripping the blue shale is 35 to 40 ft. thick and now must be shot. This also cracks the coal sufficiently so that it is dug without shooting.

Vertical drilling of overburden has been the practice. Six-inch holes are drilled and the typical pattern in 40- to 60-ft. overburden is three rows, with the first 30 to 40 ft. from the edge of the highwall, holes on 24- to 30-ft. centers each way and the rows staggered.

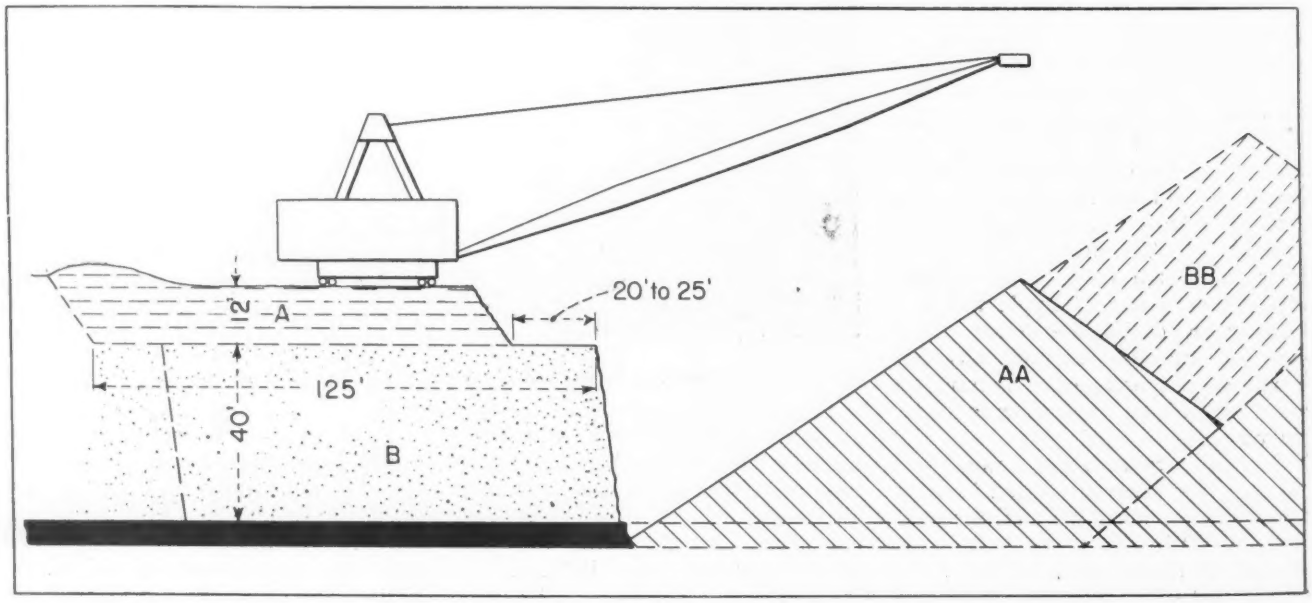
Recent experiments with a combination of horizontal and vertical holes indicate there may be an advantage in that practice. The horizontal holes are 60 ft. deep on 30-ft. centers and are drilled 4 ft. above the coal. One back row of vertical holes is drilled.

Working in 52 Ft.

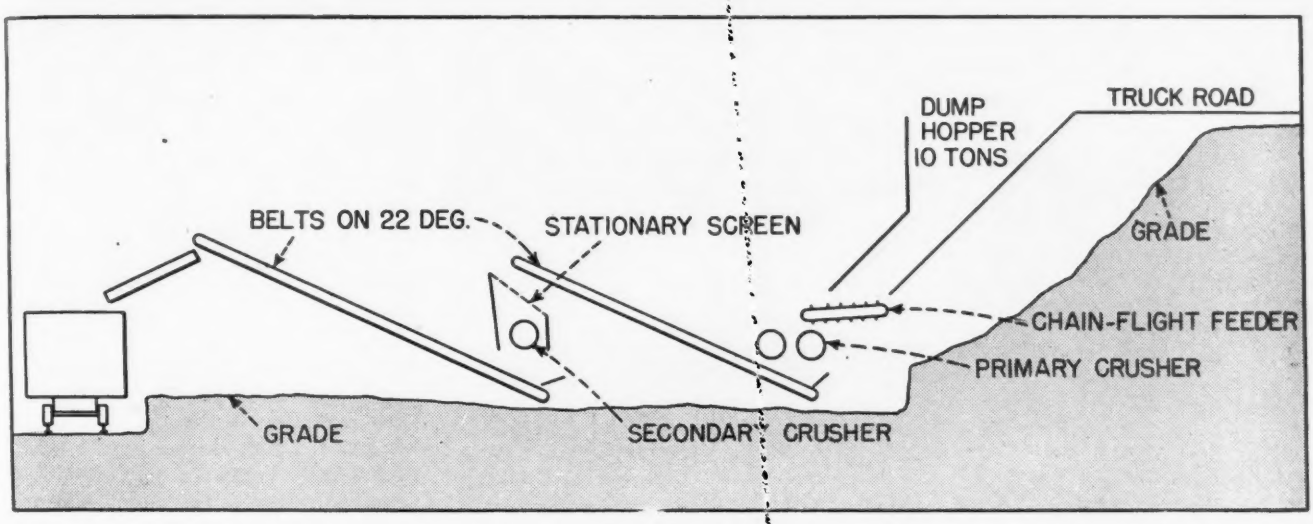
The halftones and drawing illustrate the method of work with the 10-yd. dragline in 52-ft. cover. Riding on the surface leveled by the bulldozer, the dragline digs 12 ft. deep and 100 to 105 ft. wide. That width, together with the bench 20 to 25 ft. wide left from the last digging, makes a bench 125 ft. wide. The spoil of this top digging fills the space from which the coal has been loaded and the toe of this piling is kept a few feet from the standing coal. With this larger dragline the rehandling of dirt necessary with the smaller equipment is avoided.

On the return run the dragline comes back on the 125-ft. bench, digging a 100- to 105-ft. width of that bench down to the coal and casting this dirt back over the first line of spoil. The 20- to 25-ft. step catches any cavings of topsoil and prevents that material dropping down on coal that has been cleaned ready for loading.

Where possible, openings are left in the spoil bank for drainage. In other places 6¼-in. well casing is laid in the bottom of the pit before the spoil covers the area. For this work used casing is purchased and is not recovered. The first trial of this pipe was a failure because it was not laid with sufficient regard for protection against dumping and subsequent weight and settling.



Cover was 52 ft. where the 10-yd. dragline photographs were made, so this depth was selected for the drawing. The topsoil, "A," is dug without shooting and deposited at "AA." Next the dragline comes back along the bench, but traveling closer to the highwall, and digs the hard blue shale, "B" (which has been shot), and casts it to "BB."



Schematic elevation of Bradys Bend tipple, in which the machinery is supported on ground foundations. Thus the building frame need be only a light structure to support the sides and roof.

Original equipment of the Fox mine tipple consisted of a single-deck shaker screen, on which picking is done, and a single-roll crusher, both driven by an International UD9 diesel engine (*Coal Age*, June, 1943, p. 73). To that has been added an 18x36-in. double-roll crusher driven by a 54-hp. Caterpillar D-4400 diesel engine. Rolls are set 8 in. apart and all coal goes through it to reduce maximum lump to approximately 8x12 in. The original crusher still is in use reducing about half of the mine output to a 2½-in. product. Capacity is 125 tons per hour and the tipple is operated one shift.

Machinery Set Low

The railroad tipple for the three new pits is at Bradys Bend, 10 miles from Rimersburg. The site, an abandoned industrial plant with a railroad siding, affords a hillside approach for the coal trucks so that they dump directly into a hopper that feeds by gravity to the tipple. A feature of this plant is the low mounting of the machinery so that the two crushers are on ground foundations and so that the frame of the tipple house had to be only heavy enough to support the sides and roof.

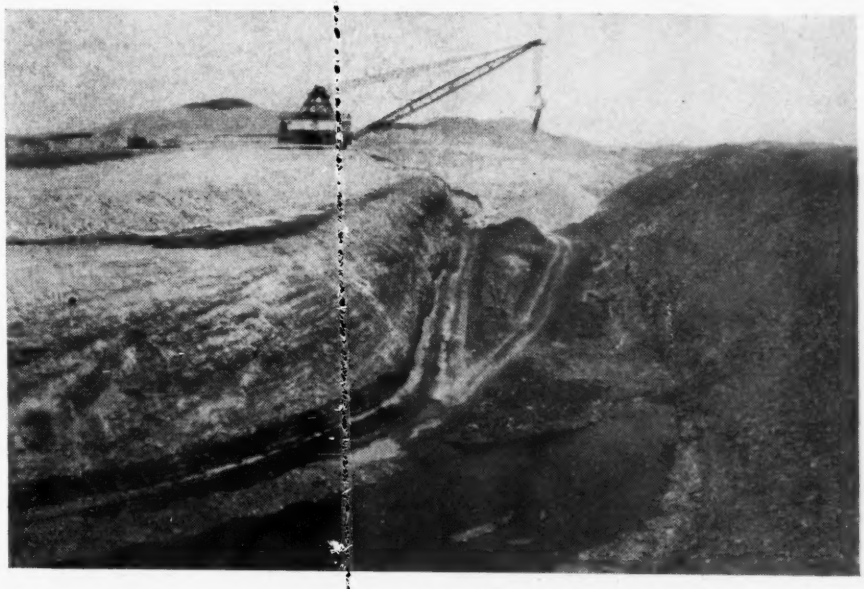
Electric motors drive the tipple machinery and are operated from purchased power. A chute with chain feeder in the bottom and a slide-valve top controls the feed from truck dump hopper to a double-roll first-stage crusher. The chain has a variable-speed drive so that the thickness of the bed on a picking belt can be regulated to afford the best picking, considering the tonnage to be handled and the quality of the raw coal. Like the Fox tipple, this Bradys Bend plant has a capacity of 125 tons per hour and operates one shift.

The picking belt elevates at 22 deg. to a stationary screen and a single-roll crusher. The undersize from the screen flows directly to another elevating belt and the oversize goes through the crusher and onto the same belt. This belt, also on 22 deg., elevates to the railroad-car loading chute. Six men normally pick on the first belt. If necessary, six more could be stationed at the second belt.

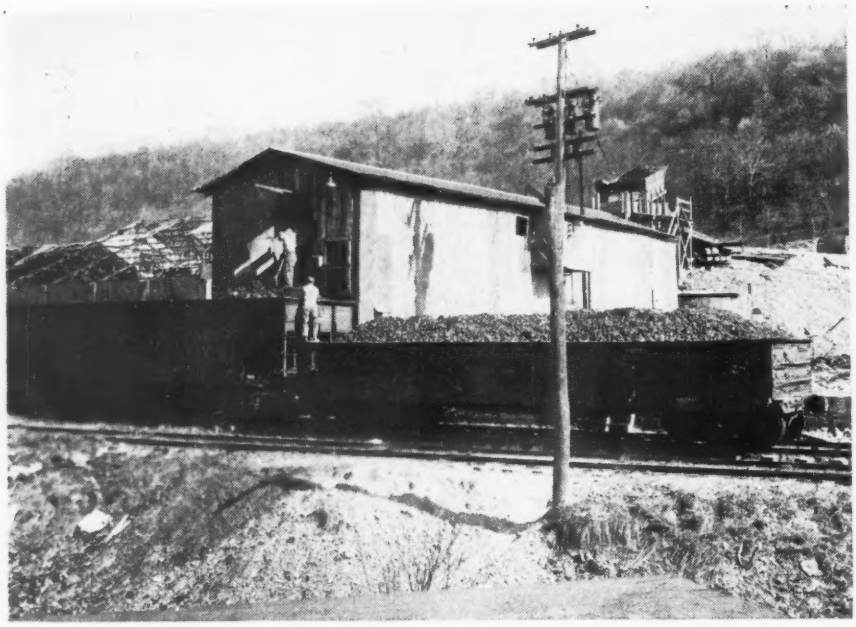
Adequate track length for storing empty railroad cars upgrade from the tipple is lacking, so an electric hoist is used for pulling and spotting three-car trips past the loading chute and then up beyond a switch, where they can be dropped back onto the loaded track. The hoist operator is in sight of the car trimmer and consequently gets his directions by hand signals.

The new mines, or pits, Nos. 1, 2 and 3, to be served by the Bradys Bend plant, are within two to seven miles of that tipple. Coals from these pits will not be mixed. No. 1 pit has two more years' work in sight and the other two, from which loading will soon start, have about two years each assured and more coal in sight for future operation in succeeding years.

Stripping at pits Nos. 1 and 2 is done with the Lima 1201 diesel dragline (75-ft. boom and 3¼-yd. bucket) which operated at Fox mine for three years. The loader is a Lima 405 gasoline shovel with 1-yd. dipper. At No. 3 the stripper is a Lima 802 shovel with a 1¾-yd. dipper powered by an oil engine. Both the "1201" and "802" served previously at Fox mine. An Allis-Chalmers AD14 tractor fitted



Looking toward the end of the pit. The 10-yd. walking dragline is working toward the camera, taking 12 ft. of topsoil. When it works back on the bench of blue shale it will be closer to the highwall and will cast the shale back over the ridge of topsoil.



New tipple at Bradys Bend. It has picking facilities and two crushers.

In the Bradys Bend tipple. Men are picking from the belt which elevates from the first-stage crusher to the second-stage crusher. By a motor controller the chain feeder (upper background) can be adjusted to provide for adequate picking.

with Baker Gradebuilder is helping in pit No. 3.

Character of terrain at the new pits is indicated by estimates that the average widths that the present equipments can strip around the hillsides are: No. 1 pit, 70 ft.; No. 2 pit, 80 ft., and No. 3 pit, 35 ft. Cover is not shot in these pits and the coal loading to date has been done for the most part without shooting. For this drilling the company owns a Hardsocg vertical gasoline unit. Holes are drilled 2½ in. in diameter and the coal is shot with 20-percent ammonia gel dynamite. For use in any pit where necessary to help in stripping tight corners and for making roads, the company has an Austin-Western 12-yd. wheeled scraper.

All trucking of coal from pit to tipple was contracted during the first few years of operation of Fox mine. In March, 1945, the company took delivery on eight new G.M.C. gasoline trucks, Model AC503, with 10½-yd. bodies. The loading of these is limited to 7½ tons so that there will be no spillage on highways and streets.

For delivery this summer an order was placed for four Type WA22 White gasoline trucks with 10½-yd. bodies. These have a rated gross weight of 22,000 lb. and the loading is expected to be 8 to 9 tons. Their bodies, like those of the G.M.C. trucks, are being furnished by the Auto Truck Equipment Co. and will have the same Gar Wood short-stroke hoists, Type F4CA.

Haulage in the pits is on the coal where possible. The bottom, however, is a hard material which presents small difficulty as a roadway. For surfacing of some of the private roads from pits to highways the company is using slag from very old piles at Bradys Bend, where one of the first iron furnaces operated in western Pennsylvania. The iron ore, which occurred in pockets, was sometimes within 100 ft. of a supply of limestone and Freeport coal. The latter was coked on the spot for the operation of the furnaces.

To control the quality of coal and direct shipments to the best advantage, the Rimersburg Coal Co. maintains a map of the cut and exact location from which each day's loading comes.

New Shop Serves Mines

A new shop to serve all operations has been built at Fox mine. One building houses a machine, welding and erecting shop and the other serves for repairing automobiles and trucks. The machine and erecting room of the first building is 40x40 ft. with a high ceiling and equipped with monorails, crossing at right angles and there fitted with a turntable switch. On the monorail trolley a Yale 5-ton electric hoist is used. Machine-tool equipment recently installed includes a lathe, shaper and drill press. With this acquisition the company has made plans to do its own overhauling of diesel engines, which heretofore have been sent out to a commercial shop.

The welding room is 30x30 ft. and the cutting and welding equipment includes two portable rubber-tired gasoline welders, one a Lincoln 250-amp. and the other a Hobart 300-amp. Gas equipment includes an Indiana "Cut-O-Matic" outfit.

Dimensions of the automobile and truck-repair building are 48x48 ft. including a partitioned room for greasing and washing. With acquisition of new trucks to do its own hauling and the complete layout for maintenance the company expects to reduce equipment delays to a degree that will save much more than the cost.

BETTER WHEEL WELDING
Achieved in New Hidden-Arc Process

New Automatic Head Used by Pittsburgh Coal Co. Deposits Metal More Than Twice as Fast—Weld Is More Dense—Electrode Loss Is Reduced and the Arc Is Screened From the Air by a Granulated Flux Covering

OPEN-ARC tire-welding heads at the Library (Pa.) shop of the Pittsburgh Coal Co. were replaced in 1944 with a hidden-arc automatic head that does a much better job, saves 21 percent in electrode material and deposits more metal per hour than the two old heads. This mining application of the hidden-arc automatic head is believed to be the first to locomotive wheels. Heretofore it had been used largely on flat work.

The arc in this new "Lincolnweld" process is screened from the air and from the eye by a covering of 3 to 4 in. of granulated flux. Some of this flux fuses and when it cools forms a coating $\frac{1}{8}$ to $\frac{5}{8}$ in. thick on the weld bead. Except for a rough top surface, this solidified coating, or slag, consists of a dark brittle material resembling obsidian or volcanic glass. The granulated flux is fed by gravity through a flexible spout that terminates to one side of and just above the arc.

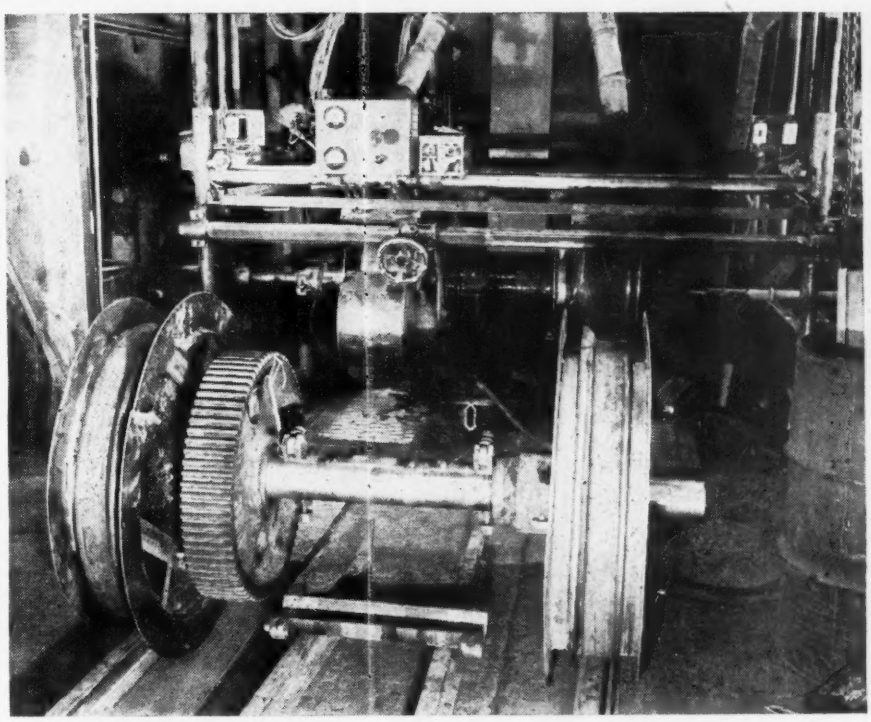


Fig. 1—Locomotive truck being prepared for the welding machine in the background. Flux holders have been clamped to the wheels. Half the bearing liner is on the axle and the other half lies on the floor beneath.

Saving 21 Percent

Electrode $\frac{5}{16}$ in. in diameter is used and the amperage is adjusted to 500 to 800, depending on the size of wheel. Bringing the wheel to a certain temperature at the finish is one of the controlling factors. More about that later. With the old open arc, sparks carried away a lot of the molten steel whereas very little is lost with the hidden arc. With the original method a pair of wheels of a certain size took 160 to 170 lb. of electrode, but with the new arc the average is 115 lb.—a saving of 21 percent in electrode purchased.

For some months after the machine was installed 0.55 to 0.65 carbon was used and resulted in a tread that was machined without difficulty. Later an electrode material of 1.00 to 1.10 was tried. It resulted in a tread difficult to machine and harder than new wheels or tires. Probably the 0.55 to 0.65 quality finally will be adopted as standard.

Porosity, present to some extent in practically all open-arc welding, is almost non-existent in the work done with the hidden arc. The wheels put in service after welding by the new method have not shown the tendency to flake off noted at times with open-arc welds when the tread fillings wore thin.

The wheels are not preheated before starting the welding, are not heated by secondary means while being welded and are not annealed after the job is finished. With the old open-arc automatic work, a gas torch was kept on the tread during the welding and no annealing was done. It has been found that final temperature of the wheel at the finish is the critical factor in preventing breakage. If it is too low, wheels and tires may break. This temperature should be 600 to 700 deg. F. Regulation is effected by adjusting current.

Practically all locomotives of the Pittsburgh Coal Co. are equipped with forged-steel wheels. The company has a few tires in use, however, and some of these have been welded with the new machine with the same success.

Direct current for the hidden-arc head, made by Lincoln, is furnished by two 600-amp. Lincoln motor-generator welders operating in parallel. A second hidden-arc head is on order for installation on the tire-welding machine and current for each new head will be supplied by a pair of welders, each pair consisting of one 600-amp. and one 400-amp. machine in parallel.

Primarily to remove the coating of flux before the adjoining bead is applied and secondarily to peen the weld,

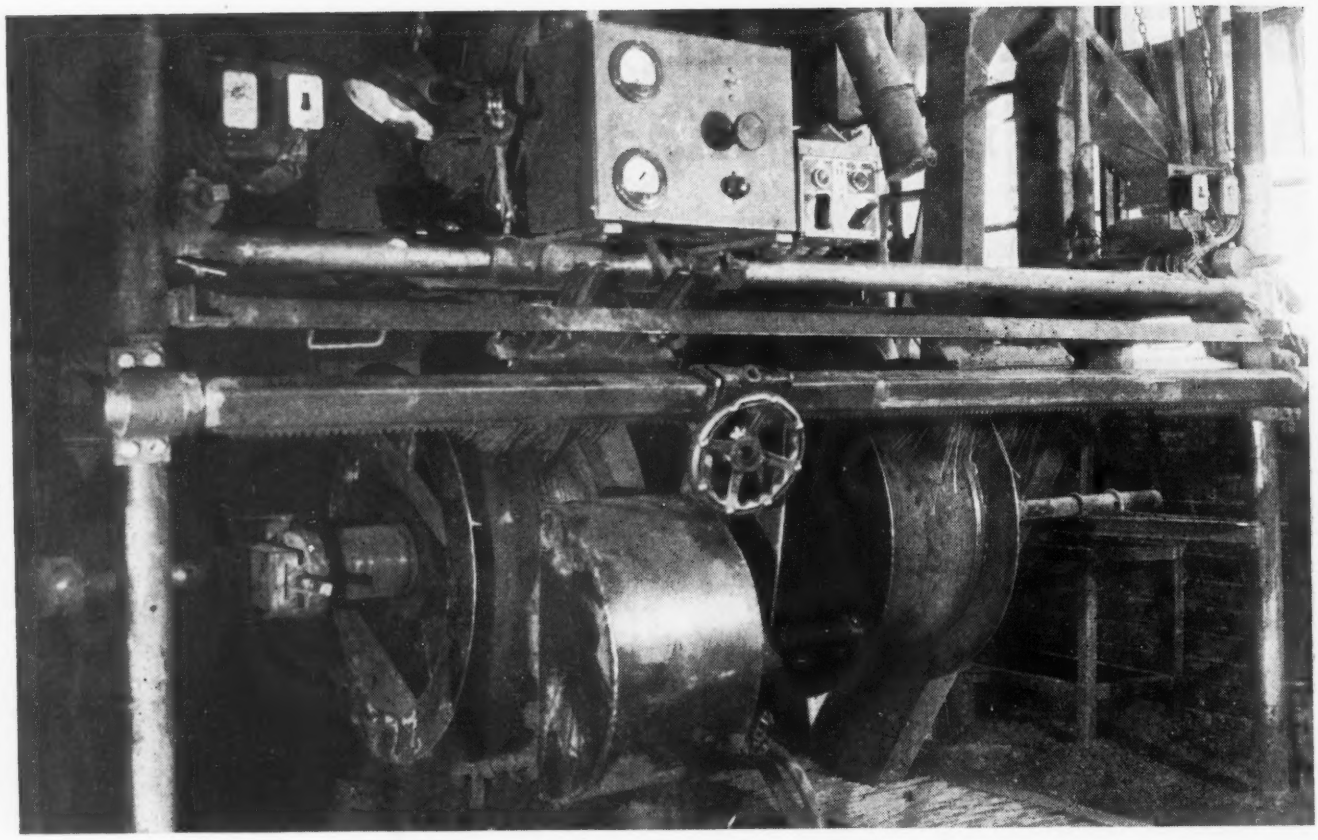


Fig. 2—One hidden-arc head in use welding one of a pair of trunnions for a cylindrical kiln dryer. Another head is on order.

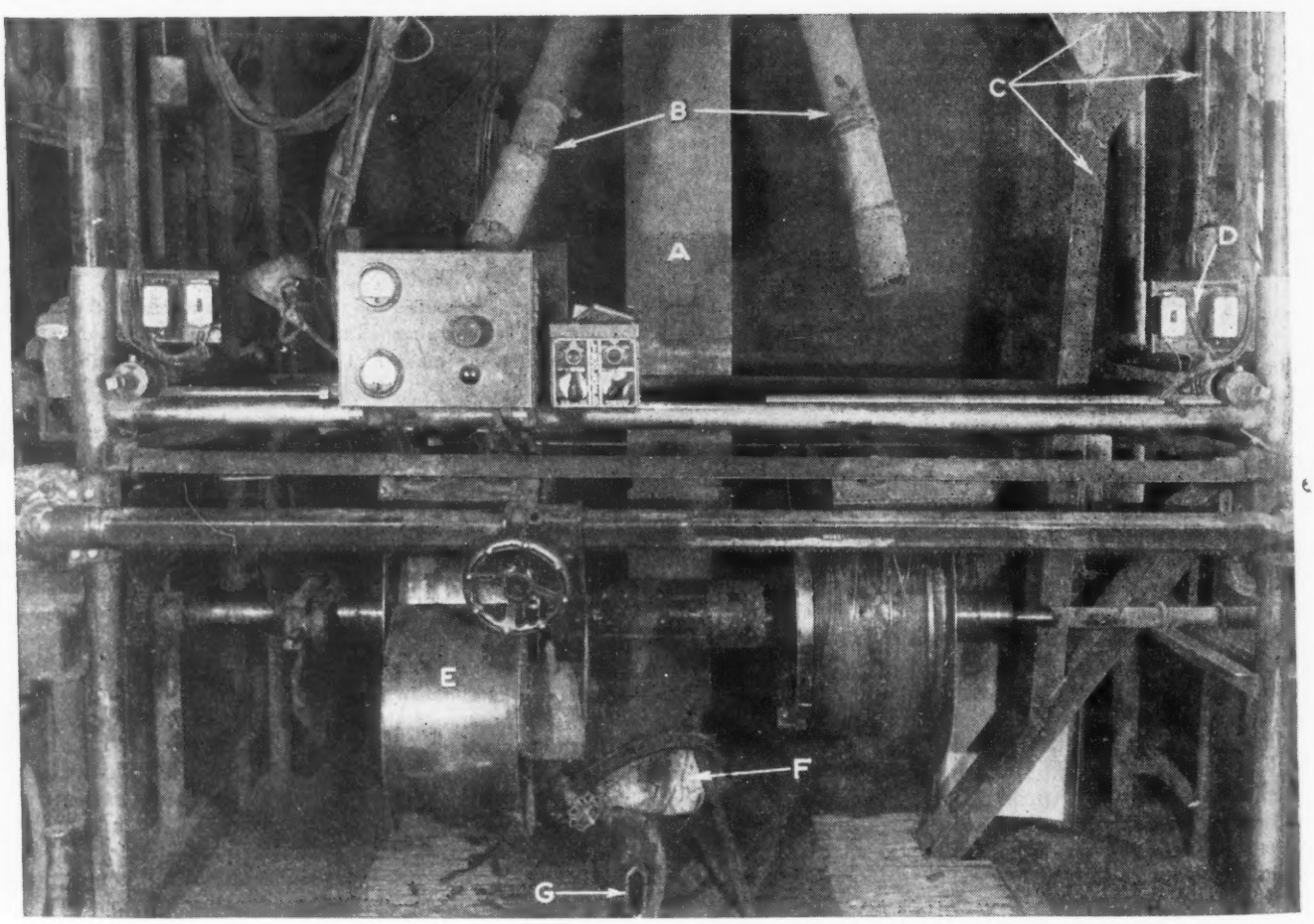


Fig. 3—"A" is flux elevator; "B," feeding tubes; "C," chutes to flux crusher which is just back of the relay panel, "D." "E" is the guard over the flux remover; "F," the ram skirt temporarily held up by a stick to show the end of the hollow wedge; "G," which locks the ram and axle bearing at proper height.

a power-driven kicker was added to the welding machine. This consists of a cylinder 12 in. in diameter carrying two rows of pivoted hammers or picks, each shaped like a mining-machine bit. The cylinder is driven by an air motor. What effect the peening has in eliminating breakage is not known. The welded surface shows numerous slight indentations made about ⅞ in. apart by the picks. There has been no breakage of wheels or tires with the new equipment. A small percentage of breakage did occur with the old open-arc welds which were not peened.

To hold the flux to proper depth around the arc, special holders have been made for each size wheel. A set of holders, shown best in Fig. 1, consists of angle flanges held to each side of the wheel by bolts through the wheel disks. The flange for the inside is split.

Brush Holds Flux

Another device, keeping the flux from sliding down along the surface of the tread, is a steel-wire brush whose bristles drag heavily on the moving surface of the wheel and flux holder. The brush shows best in Figs. 2 and 4. It is in order to explain at this point that Figs. 2, 3 and 4 show a pair of trunnions for a kiln dryer rather than a locomotive truck in the welding machine. There was no difficulty in fitting up the machine for this different work.

Flux-handling equipment constitutes a considerable part of the welding outfit. Normal carry over and spillage as the wheel rotates, plus the flux chipped off by the kicker, drops on the floor and falls through a grating into a bin at the boot of an elevator. At the top of that elevator the flux flows onto a sloping screen. The through material accumulates in a hopper, from which it feeds by gravity through a 4-in. flexible tube to the arc.

The oversize drops to a small crusher which reduces it to granular size. When the equipment was installed the standard practice was to throw away the fused flux. It soon became evident, however, that the cost of new flux for make-up would be considerable, and after a series of experiments it was found practicable to crush and reuse the fused flux. So far as has been determined in the experiments at the Library shop, the flux does not deteriorate from repeated fusing in the arc. Some welding authorities assert, however, that it does deteriorate in service.

While in the machine the truck is supported at the center of the axle by a hydraulic ram. First a special bearing housing with liners to suit the diameter is clamped on the axle. Then the truck is rolled under the machine. After it has been hoisted to proper position (the bearing housing resting on top of the ram) it is locked at that height by a tapered wedge inserted through a hole in the ram. A canvas skirt hangs down over the ram to protect its machined surface from flux that drops on the floor near it.

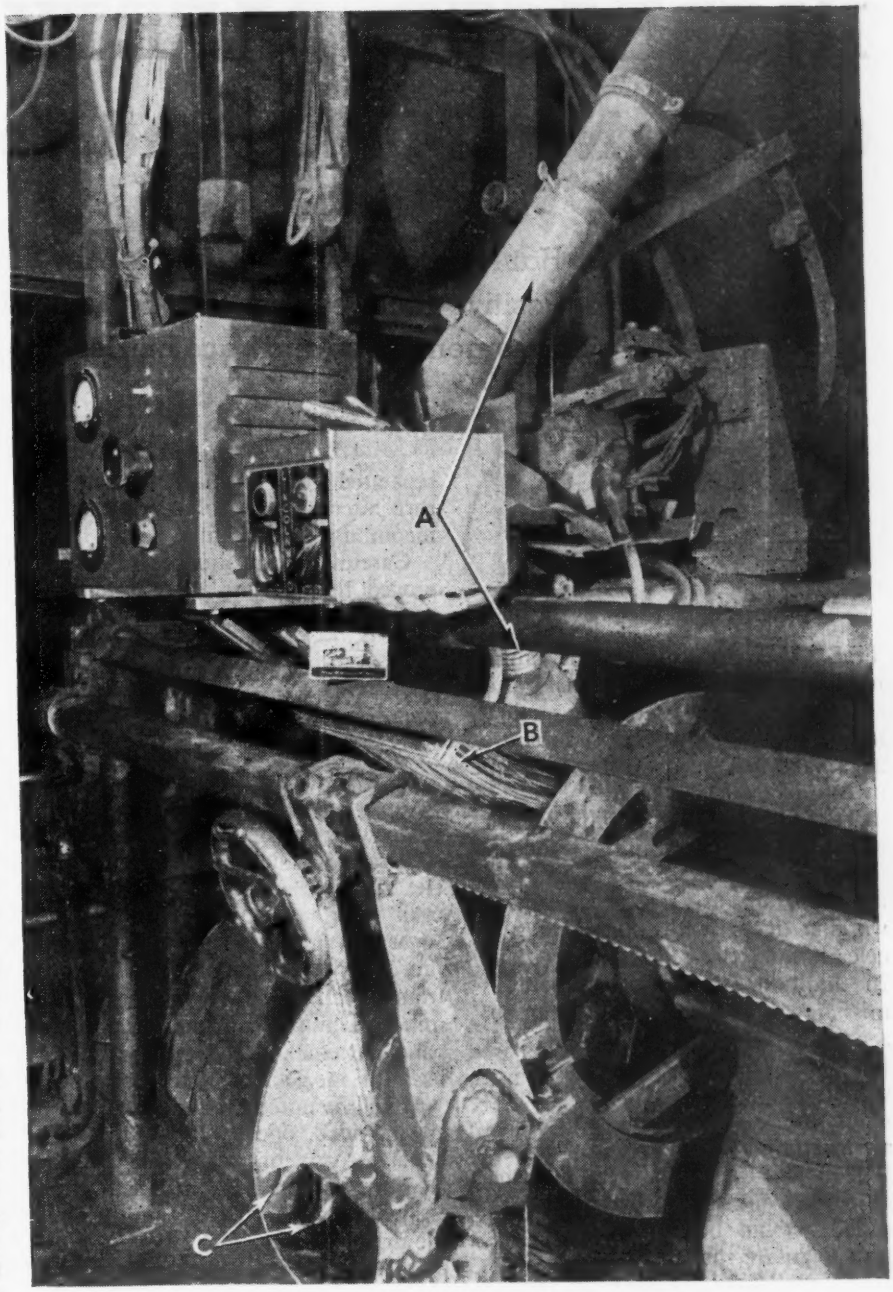


Fig. 4—"A" indicates tubes feeding flux to the arc; "B," steel-wire brush which helps hold the flux around the arc, and "C," two of the pivoted peeners on the periphery of the air-motor-driven flux remover.

Head Stepped Automatically

An operator must reverse the feed of the welding head at the finish of each layer. During the application of a layer the head is automatically stepped over the width of one bead. This is done at a certain point during each revolution by a screw feed actuated by a motor and adjustable-interval timer and takes place through a bead length of about 6 in.

The tread surface resulting from the weld is much smoother than that from the open-arc automatic, and this feature saves time in turning and also saves in electrode material cut away. In fact, the welded surface is practically as smooth as that achieved by coal companies that weld tires without removing them from the locomotives, doing the work by hand and pounding the hot surface vigorously with a heavy hammer.

INCREASED SAFETY
Goal in New Mining and Ventilating Plan

Haulageways on Pure Intake Air, Finished Sections on the Return, Positive Escapeways With Separate Intake Air Splits Provided for Emergency Use and Face Entries Are Isolated for Separate Sealing

By RICHARD McGEE
Ohio State Mine Inspector
Shadyside, Ohio

THE MAJOR changes in coal-mining methods in recent years make substantial changes in ventilating methods imperative to reduce explosion hazards and make it easier for men to escape in case of explosion or fire.

The trend toward highly concentrated mechanized mining is becoming more pronounced each year. This in turn means rapidly advancing working faces with consequent acceleration in the release of methane. In addition, it involves the transmission of power at higher amperages with its accompanying hazards. For these and other reasons, it is universally recognized that haulage roads should be on fresh, pure intake air to eliminate all possibility of ignition of methane. It also follows that all worked-out areas, whether open or sealed, should be placed on the return to insure that dangerous percentages of methane or of any other poisonous or noxious gases will not be carried to the active faces. However, because of the very fact that haulageways, where high-amperage transmission lines are consistently installed, must be on fresh intake air and the further fact that great volumes of air must flow to highly concentrated working sections, other hazards are set up that must be eliminated.

Escapeways Necessary

In spite of all improvements and advances in ventilating technique that have been or will be made it also is imperative that mine operators plan and install positive escapeways, supplied with separate splits of fresh intake air, to be used in the event of a mine fire or any other disaster. These positive escapeways should not contain any track or wire and should be separated from haulageways and return aircourses by solid strata and/or incombustible stoppings.

Careful investigation has definitely proved that a ventilating system can be devised and installed that will eliminate the hazards much in evidence throughout the coal-mining industry at the present time. The accompanying plan illustrates a system of development in which the haulageways are on pure intake air, the finished sections are on the return, positive escapeways with separate intake air splits are provided for use in emergencies and face entries are isolated from each other so that they may be sealed separately in case of fire and/or to prevent an explosion at one set of faces from affecting the other parts of the mine. The plan includes the room-panel system and is projected on the basis of mechanized operation.

It will be noted that two escapeways are provided, one on each side of the haulage roads, on both the main and face entries. In both instances these escapeways are separated from the haulage roads by solid strata except at those points where openings must be provided and maintained to enter the escapeways. These openings consist of small steel doors set in steel frames in concrete-block or brick stoppings. They also are separated from the return aircourses by concrete-block or brick stoppings and contain no track or wire and therefore are free of any possibility of fire. Openings into the escapeways should not be spaced more than 700 ft. apart on all main and face entries.

The plan also shows bleeder entries projected at the inby ends of the room panels. As indicated, the bleeder entries for each side of each set of face entries are separated by solid strata throughout their entire length. A separate split of air is maintained on each set of bleeders and the result is a positive escapeway supplied with intake air at both ends of each room panel. As a further safety measure and to provide an additional escapeway in an emergency, the room-panel entries inby the active room panel should always be holed through into the bleeder entries before the rooms are started.

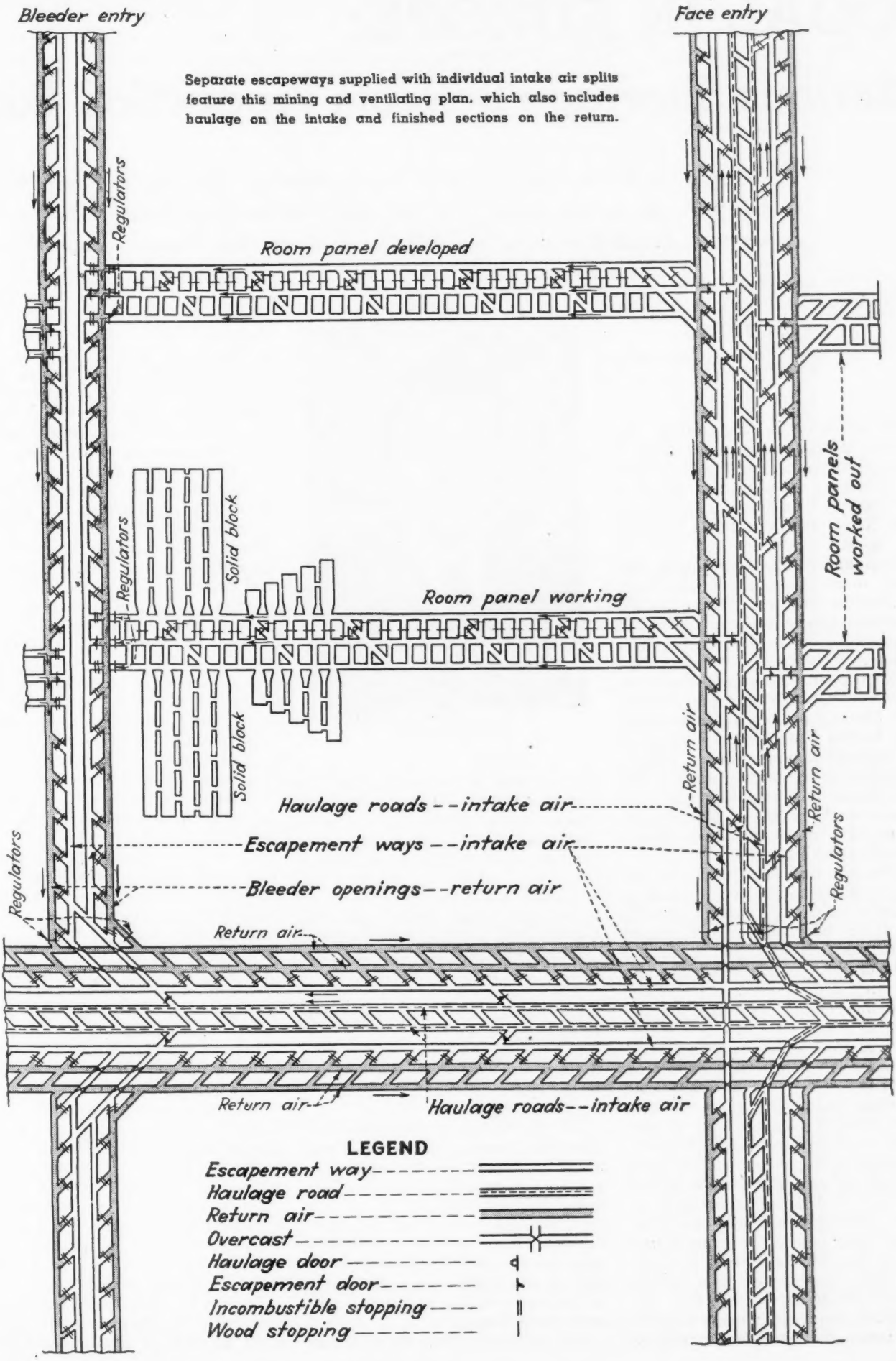
In the average mechanized set-up, this proposed plan of development and ventilation makes it unnecessary to install any overcasts on the room-panel face entries. The intake air is conducted through the two haulage-road headings and the two escapeways to the head of the face entries. At this point the volume of air carried by the four intakes is split, one part ventilating the active workings on one side of the face entries while the other ventilates the opposite workings.

Rooms will not be worked in a panel until the room-panel butt entries are holed through to the bleeder face entries. This permits placing both sides of a room panel on the intake and the ventilating air will be passed through the room panel and returned through the bleeder entries.

What the System Offers

This system of ventilation possesses the following advantages:

1. Because of the presence of four intakes on the face entries, air velocities on the haulage roads can be kept low.
2. The ventilating current for the room panels will not pass through or over any finished working places before reaching the active faces.
3. All doors are eliminated on the main-haulage openings.
4. Positive openings for escape are maintained at each end of each room panel.
5. The average mechanized set-up probably involves a maximum of 70 men in a face-entry territory and the Ohio mining law will be adequately complied with, since approximately 35 men will be on each split of air.
6. Each end of each finished room panel is automatically put on the return. The necessity of sealing either end of finished room butts therefore is eliminated.


Bleeder entry
Face entry
Separate escapeways supplied with individual intake air splits feature this mining and ventilating plan, which also includes haulage on the intake and finished sections on the return.
Regulators
Room panel developed
Regulators
Solid block
Room panels worked out
Room panel working
Solid block
Return air
Return air
Haulage roads--intake air
Escapement ways--intake air
Bleeder openings--return air
Regulators
Regulators
Return air
Return air
Haulage roads--intake air
LEGEND
Escapement way
Haulage road
Return air
Overcast
Haulage door
Escapement door
Incombustible stopping
Wood stopping

COAL IN EUROPE:

Serious Shortage Reflects Production Lag

Manpower, Food, Clothing and Transportation Shortages Main Stumbling Blocks to European Coal Recovery—Mine Conditions Fairly Good—German Production and U. S. Aid Chief Hope for Europe This Winter

By C. J. POTTER
Deputy Solid Fuels Administrator
Washington, D. C.

WEAKENED by war, Europe this winter faces its most serious coal shortage. Chaos confronts the Continent.

Germany, once principal source of coal supply for continental Europe, is the No. 1 problem. Only 15 percent of normal production has been attained under Allied occupation. Recent investigations show that many factors are involved, ranging all the way from general economic and social disorganization to insufficient manpower.

Shortly after the unconditional surrender of Germany the Potter-Hyndley Mission, on which I represented the United States, made a survey of the coal situation in northwest Europe. Members of the mission came to the conclusion that the European coal famine could be of such severity that it might lead to revolution—rioting and bloodshed.

Nor was this all. Because of the unprecedented problems presented, industry in many countries—notably in those liberated—was threatened with prolonged stagnation because of lack of fuel and economic scales thrown out of balance. Some of the Horsemen of the Apocalypse are still running wild in Europe.

In May when our mission studied conditions in northwest Europe prospects looked very serious unless some vigorous action were taken to force restoration of German mine output. France, Belgium and the Netherlands, although coal producers, have never been completely self-sufficient for fuel and they and the other liberated nations, which produce little or no coal, were faced with grave consequences unless they could obtain at least 25,000,000 tons of coal from outside sources during the 1945-46 fuel year.

Britain, heretofore a major exporter, was confronted with a coal shortage of her own and had relatively little for export. Poland could supply but 100,000 tons per month for export. Transportation problems and our own coal shortage would make it impossible for the United States to provide more than a fraction of the tonnage needed. Germany was the main hope—and German mining was prostrated by war.

Underwood & Underwood
Dr. C. J. Potter

The job entailed forcing out of the German economy the manpower and supplies needed to increase German mine output, and German coal consumption had to be shrunk to the barest possible minimum so that coal could be exported to the liberated nations. Heroic measures were needed, but the job could be done.

The physical condition of the German coal mines was not as bad as one might have expected. All factors considered, they were in better shape than many believed possible. They had been bombed, true. They had been crippled, their machinery damaged and some destroyed, but they were not beyond redemption. And, they were in the best condition of any mines in continental Europe.

Had the same thing happened in America these mines—under the guidance and skill of American engineers—would now be back in large-scale production. As it is, the liberated nations of Europe will be lucky to get from German mines anywhere near the quantity of coal they will require from that source.

First and foremost among the problems of getting German coal production anywhere near normal is labor. The big job was, and still is, to obtain competent workers. Many Germans had been taken from the mines for military service and slave labor substituted. Many thus were killed or maimed and large numbers of those who survived have not yet returned. Upon the collapse of Germany much of the slave labor was lost in the exodus. The Poles and the Czechs went home or wandered away amid the general confusion. Prisoners of war are now being forced back into the German mines and efforts are being made to recruit men from among the liberated populations.

Germany now should have 300,000 miners but only half that number is available for work. Of these 150,000 men absenteeism reduces the workday ranks by anywhere from 30 to 40 percent. One man out of four, on the average, stays away from the mines each day. And those who work have no heart in it. The net result is miserable. The average output per man is but one-half that of the slave labor and only one-third of normal.

The transportation of mine workers is very poor, due largely to the lack of power for interurban lines. Clothing is another important factor. Many miners have only the uniforms in which they were captured and when these must be washed or mended the absentee rate skyrockets. Food is another major problem, with men undernourished and physically unfit for arduous labor underground.

Properly handled, 75 percent of the production of German coal mines could be restored relatively quickly.

To do this requires drastic measures—even to the point of forcing Germans into the coal mines at a faster rate. As the Germans were not reluctant to force other people to do their work when the Swastika held sway, fair play and retribution demand that the picks be put in German hands. With the picks should go food to support hard labor. The present ration could easily be stepped up to 3,400 calories a day by taking an average of only 18 calories away from the food ration of other Germans.

There is enough mechanical equipment available in Germany if its use is concentrated in the mine fields. In fact, the mines were not too bad off in this respect even at the end of the war. Every mine kept a spare hoisting sheave and rope—something not done as a general rule even in America. Present shortages are primarily of alloy steel and timber.

Germany is a sick patient. She has to be examined with respect to every part of the body politic. In other words, she must be treated as an economic whole. This is particularly difficult at this time since the defeated nation is divided into four zones, with Great Britain, Russia, France and America charged with administrative units.

Coal being of the essence, Great Britain has the responsibility of getting out the major part of German production since the vast bulk of this precious product is in the Ruhr—her jurisdiction. Under the present set-up—and this goes for all Germany—there will not be satisfactory production. I am sure that the goal will be missed.

Under adequate supervision, backed with proper authority, the coal that is needed could be produced in Germany. The equipment is there to be salvaged. The workers are available for labor—if forced into it. They would have to be fed properly, clothed and sheltered and their families cared for, but all that can be accomplished through the proper agencies—and there are many. It can be done, too, without sentimentality.

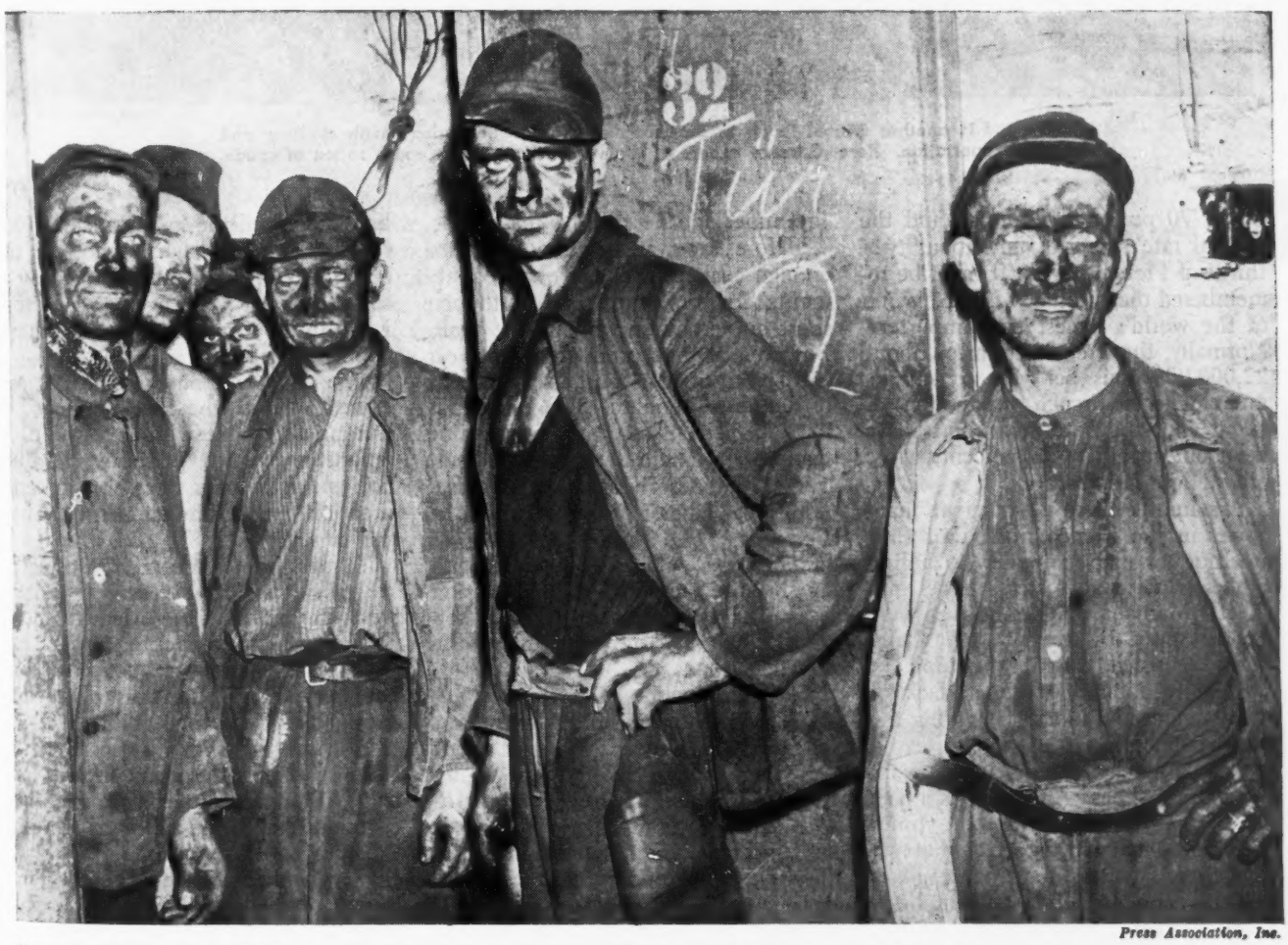
The plan envisioned means squeezing out of the German coal mines every ounce of potential energy, reducing German coal consumption to a bare minimum, and making this necessity of life available to all other nations on the Continent.

Even with an all-out effort, forcing Germany to come through with every available carload of coal, the liberated nations still will be shy some 50,000,000 tons of their normal needs. In peacetime these nations required 135,000,000 tons to run their factories and heat their homes. This year they can thank their lucky stars for whatever quantity of coal is delivered over and above the so-called "minimum essential requirements."

Import coal needs for the liberated areas to meet these "minimum essential requirements" in the present coal year have been estimated at: France, 13,000,000 tons; Belgium, 3,800,000 tons; The Netherlands, 2,400,00 tons; Norway, 2,600,00 tons; Denmark, 1,400,000 tons; Italy, 5,600,000 tons; and Greece, 400,000 tons.

At best, it looks like a long hard, cold winter on the continent of Europe. Exports from Britain probably cannot be increased and may not even be maintained. We shall ship what we can from the United States, but it would be impossible to meet more than a fraction of the European deficit from this source.

Production in France is but about



Press Association, Inc.

German miners after finishing a day's work at the recently reopened Walsum pit in the German Ruhr. Germany should have some 300,000 miners, but only half that number are available for work and absenteesim runs from 30 to 40 percent.

Press Association, Inc.

Food is another critical factor in European coal production, along with clothing and transportation. Here, German miners at Walsum line up for an extra ration of spuds.

65 to 70 percent of normal, and the normal rate supplied only about two-thirds of French needs. It must be remembered that normally France is one of the world's largest coal importers. Normally, the French imported about 22,000,000 tons per year to supplement normal French production of about 44,000,000 tons. Imports have been cut to about 10 percent, while production lags badly.

Apparently there is sufficient manpower in the French mines but they are short of many supplies, including rubber, lubricants, steel plate and sheet. Many mine locomotives were carried away by the Germans and never returned. Mining equipment was badly damaged through lack of maintenance and lubricants during the Nazi occupation.

The French miner needs work clothes and shoes. And there is a lack of incentive to work. After the miner has earned enough to buy whatever food there is within his reach there is nothing else for him to purchase. Black market prices are prohibitive. There is no miner transportation problem in France. The worker lives near the mines and he still has his bicycle.

Before the war Belgium produced enough coal to meet her own requirements for the most part, although short on certain special-purpose coals. But even at that, production this year will be but little more than 50 percent of the peacetime rate. The nation has but 60 percent of its prewar mine manpower. There are enough outside workers but not workers at the face. Additional labor is being recruited in Germany. The mines are short of timber, steel arches, lubricants and small mine supplies. Transportation is good and the Belgian miner is better clothed than miners of other liberated nations.

Coal production in The Netherlands is about one-third the prewar rate and the mines have only about half their prewar manpower. Many types of supplies are short and the inadequacy of worker transportation is an important factor in retarding production. The miners have bicycles but no tires. Synthetic rubber could be used but there was not enough coal available to manufacture the tires when I was on the ground. Holland has recognized the importance of food to the miner, having allotted the Dutch miner 4,000 calories per day as compared with an average of from 1,500 to 1,800 per day for the general population.

We all have good cause to be concerned about the fuel supply in Europe this winter. Our mission in reporting to the Combined Production and Resources Board on the coal situation in northwest Europe had this to say:

"Unless immediate and drastic steps are taken, there will occur in northwest Europe and the Mediterranean this winter a coal famine of such severity as to destroy all semblance of law and order—and thus delay any reasonable chance of stability."

Without wanting to appear as an alarmist, that is the plain unvarnished truth. Europe cannot be plunged into economic and political chaos without the rest of the world, ourselves included, being adversely affected. That is why everything humanly possible must be done to increase German production and to export the most that can be sent from America.

GETTING RESULTS

In Maintaining Coal-Preparation Plants*

How to Maintain and Repair Raw-Coal-Handling Equipment and Mechanical-Cleaning Units—Tested Methods for Getting the Best Results From Lubrication, Wear and Corrosion Prevention and New Materials

By FRED W. RICHART
Assistant Editor, Coal Age

PREPARATION-PLANT maintenance crews have a real job. Not only must they overcome any errors in design and operation and patch up wrecks but they must complete jobs before the work whistle blows. Occasionally there is little to do beyond routine inspection, minor adjustments and cleaning house. More frequently there are bolts, links, bearings or screens to replace, sheets or braces to weld, controllers to adjust or motors to change.

Get Repairs Ready Ahead

Now and then complete sections of machines, chutes, conveyors or tanks must be patched, rebuilt or replaced. Extensive repairs usually are planned ahead, the fabrication and fitting done in the shop and the parts assembled handy to the job. The crew then has a full shift in which to weld and bolt the parts in place, and perhaps time to test them out.

When such a complete overhaul is made it is the practice at one plant to paint the new parts red. Thus, every man knows they are new and does not spend unnecessary time in inspection. While on the subject of painting, it is well known that it is virtually useless to paint over damp or rusted surfaces. Paint will not adhere and corrosion does not stop. A flame-brush has been devised to evaporate quickly the moisture from metal surfaces to be painted. The heat also expands and breaks the rust from the solid metal. The surface may then be wire-brushed clean and the paint applied. Good reports come from the use of this method.

There are so many variables about a coal preparation plant and its operation that maintenance needs cannot be predetermined by rule. Experience alone will fix the size of the crew and the supplies and parts that must be stocked to meet repair and renewal needs. One man per thousand tons run daily might meet the requirements of the average plant. But there are plants that use more and a few exceptional plants that use so few that it is almost unbelievable. The builders of the plant should be able to make a preliminary estimate of these needs.

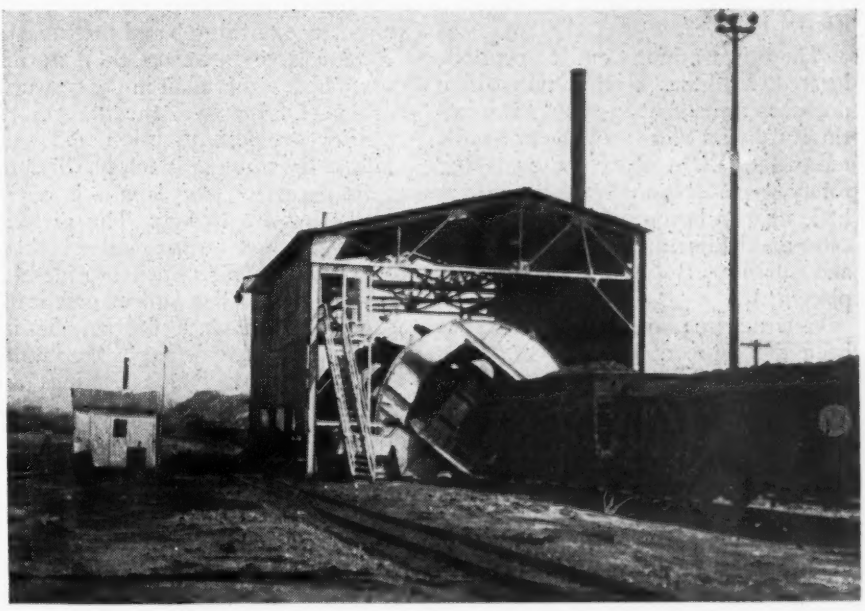
In attempting to compare maintenance with that of another plant, it must be remembered that there always are differences in conditions, such as wash-water acidity (pH). There are conditions that nothing can be done about, such as pyrite and other gritty material in the coal. These things may greatly affect the life of plant equipment. In many cases "taking the bull by the horns" is more important than making comparisons.

In this series the experiences of a number of preparation plants using mechanical cleaners are discussed. The discussion may concern a related group of equipment which operates as a unit, such as a jig-box assembly, or be a broad consideration of like units from all over the plant, such as chain conveyors. The intent is to make general statements where they are justified by experience, and to give specific examples of wear or failure along with the remedy applied. It is hoped the reader may "go and do likewise" with success. An attempt has been made to confine the material to questions of known interest or types that many may follow to advantage.

Repair or Replace

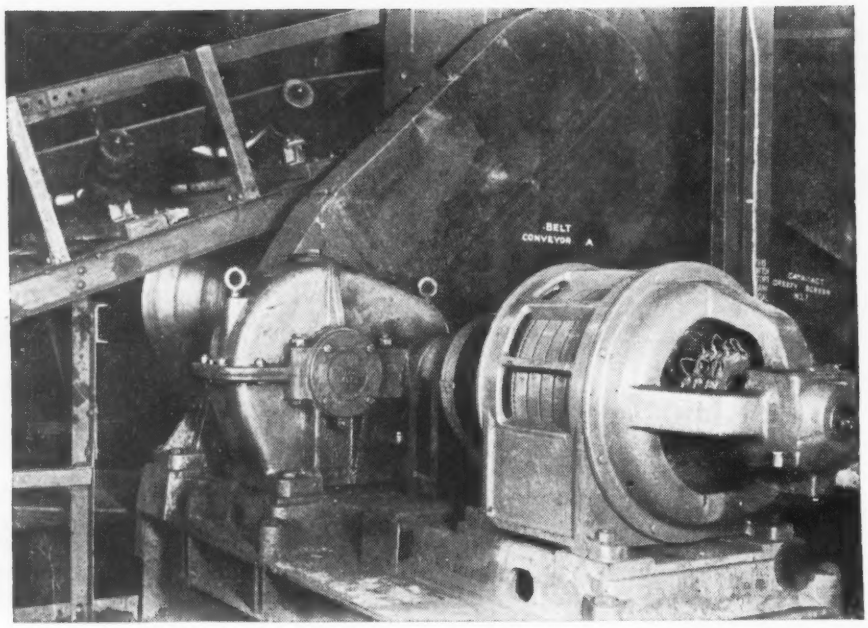
One prominent washery engineer raises the question: "Does it pay to repair parts rather than use new parts?" Aside from the fact that the supply clerk cannot always guess what parts must be in stock, unexpected emergencies do arise. In that event repair jobs may be necessary whether they pay or not.

A coal mine is not a machinery



Motor-driven rotary car dumpers do not require much maintenance.

* First of a series of articles on practical methods of achieving results in the maintenance of coal-preparation plants.



This slip-ring motor drive for a raw-coal belt has run ten years with little maintenance. High torque is required for starting a loaded belt.

manufacturing plant. In that sense it usually cannot compete with the manufacturer. Frequently repair jobs do cost several times the cost of a new part. But when a broken part holds up operation, whether it pays is not considered. Excess cost may be cheaper than shutting down. However "Does it pay?" might well be asked about every job.

One thing is worth jotting down. Actual processing can only be tested and developed in the plant. For this reason many improvements originate at the plant because of the work of the maintenance crew. For this reason much repair work does pay dividends.

Raw Coal Supply

There is a minor trend to centrally located washeries serving more than one deep mine or strip pit. This sometimes calls for a car dumper to handle railroad cars. Most of these are the rotary type. Normally they require little upkeep beyond inspection, lubrication and adjustment. Wearing strips and small parts often may need replacement.

Overspeeding on the return trip has been the cause of breaking the bearings of the drive shaft when the drum hits the stop. At one plant this has averaged once a year. This might be remedied by track switches (electric) to limit motor speed near the end of the movement. The fact that cars short of normal weight by varying figures must be handled complicates the problem. The track-switch solution may call for a slip-ring motor. Another possible method would be an air cylinder to cushion the final few inches of travel.

It is desirable to supply coal to the jig box at a uniform rate and to avoid running entirely out of coal. A feeder ahead of the conveyor usually takes care of this. A Selsyn motor signaling system is one way the jig box attendant can be notified of a change in the rate of coal feed. It may be calibrated to show tons per hour. It is a reliable, accurate device which might find numerous applications for remote control and signaling, thus reducing maintenance.

Both rubber belt and steel chain-and-flight conveyors are used to transport raw coal from the dump bin into the preparation plant. Because of the importance of this job and the capacity of these large conveyors they are discussed here rather than in the conveyor section. Of the two, the rubber belt requires the less attention and generally is the more satisfactory. Because of its necessary long length it is the most expensive to buy. The present-day practice of using sealed-ball or roller (lubricated-for-life) bearings for troughing and idler pulleys practically reduces maintenance to periodic inspection. It is important to keep water and dust away. Failed bearings are removed with pulley and shaft and a new assembly is inserted in a matter of minutes.

A belt conveyor should be centrally loaded to prevent it from running to one side. In place of guide rollers, which may wear the edge of the belt, troughing and return trainers which automatically keep the belt running straight are available for installation.

The life of large-capacity raw-coal belts is up to seven, eight or more years. Belts carrying 1,000 tons per hour have records of over seven years. Better life than that may be expected from belts that are oil-resistant. Endless belts mounted on training pulleys and protected from bruises may be expected to give maximum life. Factory service men are qualified and equipped to make a perfect splicing job. "It pays, at a cost of $100 or more per splice," says one preparation engineer.

Most raw-coal chain conveyors are the roller type in which the weight of the chain and buckets is carried on rollers. This prevents wear of the guide angles and reduces the chance of accidents and shutdowns. The life of these chains varies widely, depending largely on lubrication. Rollers equipped with pressure fittings, where the lubrication is religiously done, have a record of up to seven or more years of life. In one case where pressure lubrication was abandoned because "it was too much trouble and too expensive," the life is down to two years. Two years seem to be about an average life of this type of chain where drip or squirt oiling is used.

Cleaning Units

The jig box is the cornerstone upon which plants using this equipment are built. Quality of product depends on its accurate operation. That in turn depends on its design, mechanical condition and accuracy of adjustments. Several preparation engineers advise that the jig-box assembly requires more maintenance attention than any other element of the washing plant.

Many plants use some form of the jig in which water pulsations are set up by compressed air. The parts most subject to failure are raw and washed coal chutes, screw conveyors and bearings, refuse elevators, cell partitions and screen plates.

There is some corrosion and erosion in the jig box. One large plant has purchased a flame-head (previously noted) which it proposes to use in connection with painting the inside of the box. Although it had not been used for this particular purpose at the last report, it has proved to be very successful in somewhat similar jobs.

Washed-coal chutes and launder bottoms have been saved from complete destruction when steel was scarce by paving them with hard brick or glass laid in cement mortar, covering them over with a few inches of concrete, or lining them with sand-cement mixtures put on wire mesh,

tack-welded in place. In the case of a large launder washer a section was paved with a 4-in. thickness of concrete in 15 man-hours. The ratio of the mixture was twelve shovels of crushed limestone, eight shovels of sand and one bag of cement. It is good after 30 months' service. Brick lining is still good after four or five years.

Another plan for prolonging the life of entry and discharge chutes is to bead them over with hard welding rod. This is effective and may be repeated when necessary.

An approximate life of four years for cast-iron jig-box screw conveyors is indicated by the experience of several plants. The metal under-water bearings of these conveyors are short-lived, ranging from six months for pressure-fitted end bearings to two months for unlubricated center bearings. Water-lubricated plastic bearings last three years in a calcium-chloride washbox. They are in use for other under-water applications and are quite successful when flushed with fresh water to keep grit from entering. Water-lubricated bearing linings made of plastics have been used for a long time for slow-moving journals.

Jet Supplants Conveyor

One washery builder uses a removable wearing sleeve for this screw-conveyor bearing. Observation of a discarded screw indicated no help in this particular operation, possibly from lack of attention at the right time. In one washery the screw-conveyor problem was so difficult they were discarded in favor of water jets, three for each screw, all directed toward the refuse elevator. Although it requires an extra pump to supply the water, the owners are well pleased.

The lower bearings of the refuse elevators are in the same class with the conveyor bearings just discussed. Plastic bearing linings are successfully used. In some plants they are continuously flushed with fresh water to exclude the grit that otherwise is bound to get in.

Because of their many parts, jig-box elevator chains are a more difficult problem than bearings. Flat-rolled carbon steel is ued to some extent for chain links. The most successful chains are made up of cast manganese steel links, with pins or bolts of the same material. One plant of a string of mines which has tried many types of chains has settled on a heavy-duty chain of this type in which all the links are alike. Bolts with a washer and screwed nut are preferred for connecting the links, the nut being spot-welded to prevent it coming off. Many other washers use the same chain or its predecessor. The latter is made up of a bar with forks at both ends and a straight connecting bar link. The new design has sloping lugs which slide by any obstruction. Such chains last two to four years.

Good results are reported from another type of manganese-steel chain of three-part construction. This consists of a male link, a female link and bolt. The heavy wear is on the bolts, which are the first items replaced. Following that the male link is upset to compensate for wear. The third repair step is another new bolt. After that wears out the chain is scrapped. Since the bolt does not turn in the female link there is no wear at that point.

Elevator buckets usually are stiffened by a strap around the lip. Sometimes a second strap is added. The lip often is hard-faced with welding rod to resist the wear of scooping up gritty refuse.

Cell partitions and screen plates are subject to the breathing action set up by water pulsations. Eventually this will crack a poorly braced plate. Some jigs have sections of round pipe welded between cell partitions to support them. Unsupported partitions may be stiffened with heavy angles. In one case 4x4x½-in. angles welded on solved the problem.

Screen plates sometimes are not well enough supported or anchored. One plant used heavier supports and twice the original number of bolts. However, plates still fail by cracking along the most rigid line rather than wearing out by erosion and acid.

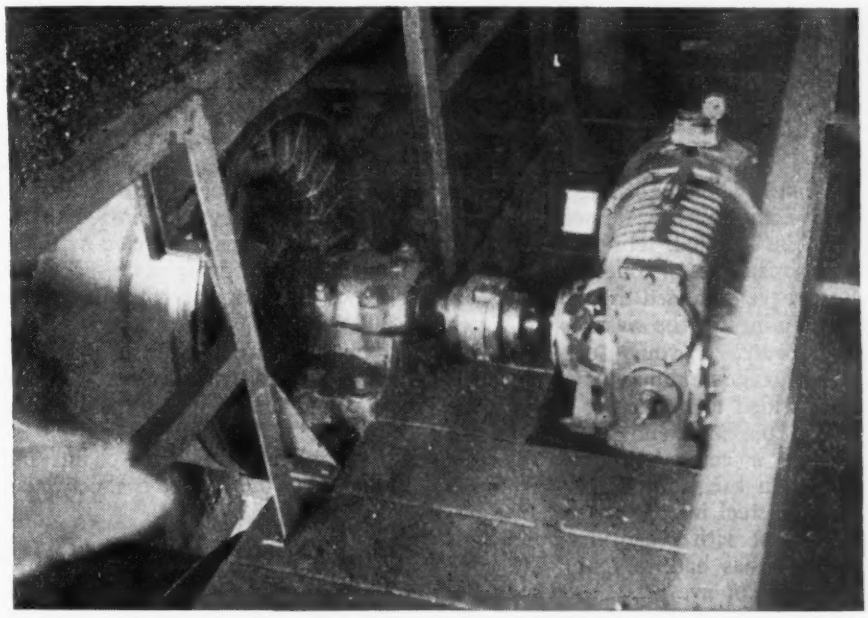
Due partly to the "U" shape of the jig box, there may be a tendency for the impulse to be lightest on the side opposite the air equipment. The impulse may be evened over the screen-plate area by baffles set in the cells. Experiment will determine the number of baffles, the area and the pitch. In one jig box three baffles are used in each cell. Such wear as may occur in screen-plate perforations usually may be compensated for by adjusting the air valves. Such wear is of little consequence, according to one successful washery foreman, who also says: "We prefer screen plates not any thicker than ¼ in."

Differential Screens

Another washery engineer with both sales and operating experience prefers to balance the water impulse over the screen plate by using differentially punched screen plates. In this case the smaller perforations are on the air side of the jig and the larger perforations opposite.

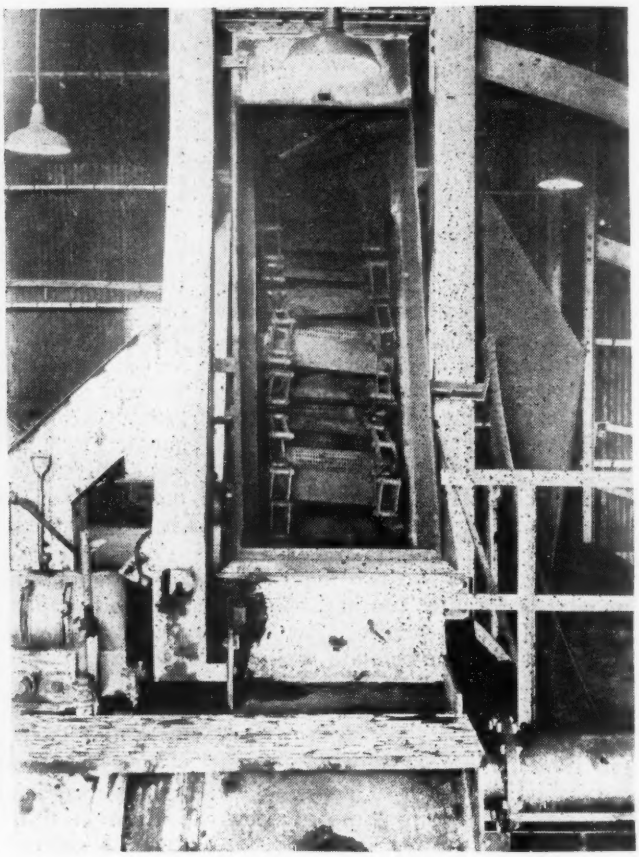
The compressed-air system gives little trouble beyond the cleaning of compressors, piping, tanks and valves. Users of both centrifugal and positive-displacement types of compressors say "They don't wear out." Dust and spray oil deposits in both types are relieved by kerosene or carbon tetrachloride fed into the air intake. However, the head of the blower type must be removed occasionally and the lobes wiped clean.

To produce the necessary pulsations in the jig box air is released periodically from the air tank. This causes continuous changes in pressure which vi-



Although scrap iron will not float in a washer, a magnetic pulley at the head of the raw-coal belt is double insurance against damage to equipment and complaints from customers.

An expert job of splicing helps the belt run true and saves trouble with training idlers. Such belts may be run at higher speeds.



This elevator wreck is the result of taking a chance.

brate the pressure-gage hand. Resulting wear finally will cause inaccurate indication. Two methods are suggested to practically eliminate this effect. A pressure snubber may be placed in the air line to the gage. This is somewhat equivalent to a needle valve, improved. The second method is to put an air receiver in the line. By adding a valve to throttle the air flow complete elimination of gage-hand vibration will result.

Cones Need Repair

Cones, whether of the classifier or sand flotation type, do wear out and must be patched, relined or replaced. The operators of one sand-flotation plant have discussed the idea of a concrete lining for the wash cones, which wear badly. It would seem that perforated ribbed building partition sheets spot-welded to the inside of the cone would be sufficient foundation for holding a cement lining. Concrete flumes in this same plant very much outwear steel in that service.

A plant with a classifier cone built in 1938 has had to reline the cone after four or five years. Although the inclined side of the cone wears out by reason of hard refuse sliding over it, the cylindrical classifier section at the base of the cone still is in working order. This is due to the fact that vertical areas do not have to carry refuse weight and, therefore, suffer a minimum from abrasion.

Among washers using special mediums is the chloride unit. Several years of operation has proved that maintenance is low. In one installation the chloride liquid is emptied every two weeks into the chloride storage and all wash-box parts are given a thorough examination. The submerged bearings are nonmetallic. The screw conveyor bearings are plastic and the tail-shaft bearings of the coal conveyor are rubber. The latter is a fluted rubber sleeve vulcanized to the metal. These bearings have a life of about three and two years respectively. The washing capacity of this unit is 1,000 tons per 8¼-hour day.

The maintenance consists of replacement of worn parts. Over a seven-year period the following material has been used:

1 complete set of three chains and 28 flights for the washed-coal conveyor.

129 shear pins.

39 V-belts.

8 impellers for circulating fluid.

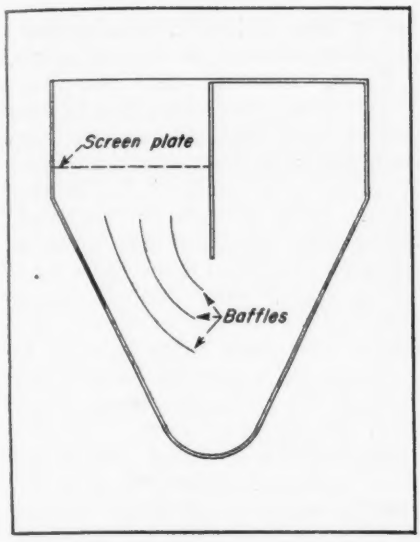
64 bearings, 47 of which were impeller-shaft rubber and ball bearings.

As with wet washeries, the auxiliary equipment for air cleaners is much more difficult to keep in repair than the cleaning units themselves. This is especially true of ducts, cyclones and fans which handle and dispose of the dust.

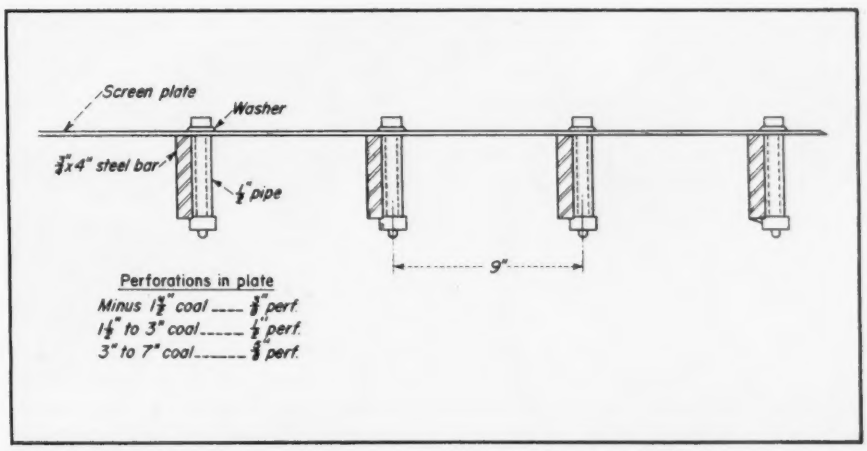
Three plants with a total of 16 units were investigated in this survey. Plants A and B have been operating ten years and Plant C for nearly five years. They are not all of the same model, width or capacity, nor are the coals of uniform size. Although hardly comparable, the experiences are of interest. The difficulties with dust apply to any plant handling coal dust carrying gritty material.

Plate Must Make Things Go

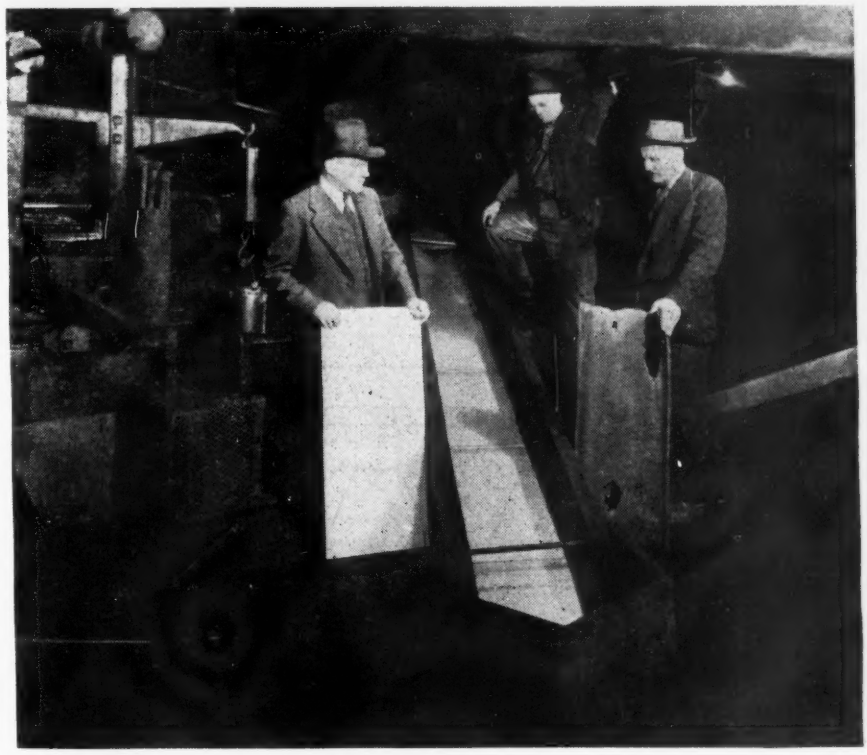
In one type of installation the cleaning "boxes," being stationary machines made up of small parts of light weight and handling small coal, are not expensive to maintain. Moisture and fine coal may require frequent regulation of the feed by the operator. Some adjustments are important. The zoning plate must be close enough to the deck to keep the layer of refuse moving, but not so close as to crowd the refuse between zoning plate and deck, thus wearing grooves in the deck. With a 5-in. bed at the discharge end the zoning plate seems most efficient at about 1¾ in. above the deck. Old type zoning plates had approximately ⅛-in.



Shape of the jig box may result in pulsations being heaviest on the far side from the air source. In some cases this is evened out by using smaller perforations in the plate on that side. Illustrated here is a method involving insertion of baffles to direct the water evenly over the screen area. Experiment determines correct size and shape. At one plant, three baffles located about as shown did the job.



Chief trouble with jig-box screen plates is lack of solidity. If not held down firmly, they break and fail. The plan illustrated solved the problem for one washery. The ¾x4-in. bars were welded in the jig box at the proper level at intervals of approximately 9 in., center to center. Half-inch steel pipe sections were welded to the sides of these bars at 9-in. intervals. Through bolts to hold down the plate completed the job.



Glass plate, along with concrete, brick and sand-cement mixtures, lengthens the life of chutes in preparation plants.

perforations. Later machines use plates with large square or rectangular perforations. In the latest models zoning plates are made from coarse woven-wire screen cloth.

Inspection and cleaning of these units is even more important than in wet-cleaning equipment. Fine coal dust, especially when moisture is present, blinds the deck screen and gets into the marble pack. At Plant A, cleaning the deck screen and marble pack is timed by the air pressure that builds up under the marble pack. Starting with ⅞-in. water gage, the air pressure is gradually increased by dust accumulation and blinding. When the pressure builds up to 1¾-in. water gage not enough air passes to do a good job of cleaning. The box is then opened up, the deck screen removed and brushed clean and the marble pack blown out. The deck plate is $\frac{1}{32}$ in. thick and the perforations are less than $\frac{1}{16}$ in. Life of the deck screen and the zoning plate are about one year each. Once a week the air is fully opened up to blow the packs clean.

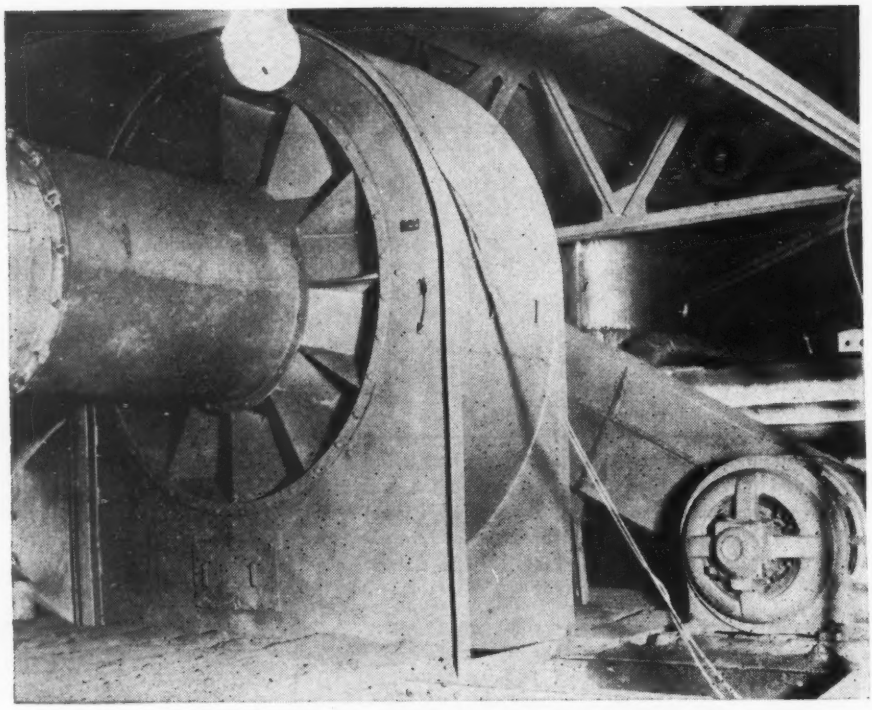
In this model the suspension links carrying the zoning plate wear out with the plate, but since they are cheap that expense is small. The dashpot box rusts out because of the presence of sealing water. The dashpot is eliminated from the later models.

Plant B was originally a pilot installation for experiment with several sizes from 2 in. down to zero. Now that it is used for stoker coal only, maintenance is very small and confined to bearings and shafts, mostly for elevators and conveyors. One zoning plate has been replaced in the ten-year period.

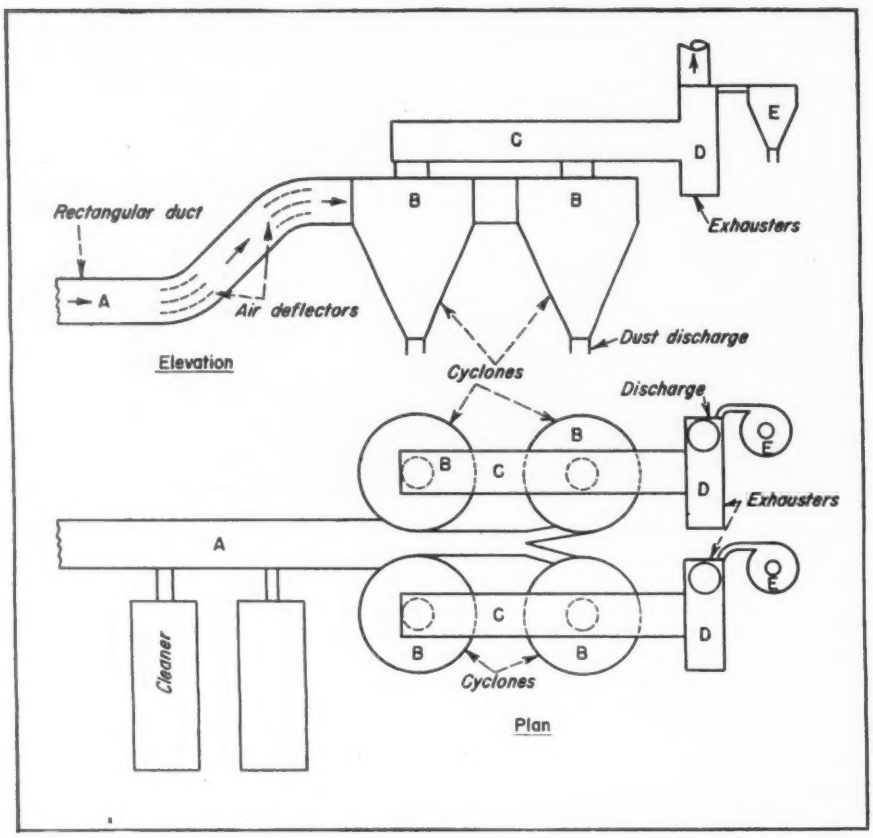
The practice at Plant C is to clean the fine-coal units every three days and the coarse-coal unit every six days. The perforated bronze deck plates are broken up into 18-in. sections. Since installed, almost five years ago, these plates have all been changed once, with some at the feed end changed a second time. The perforations in these plates are 0.040 in. for the fine coal and 0.050 in. for the coarser coal, with 22 percent open area. Plate life averages 2½ to 3½ years. No rotary valves and but two screw conveyors have been changed to date.

Other parts to require some attention on this model are the gear reducers, stationary half of the variable-speed pulleys and some supporting parts of the zoning plates. A wear plate was necessary where the clean coal is discharged. These parts are all small and inexpensive.

Plants A and C handle large quanti-



Blower fans last a long time where the air is free from abrasive dust which, in fans which receive their air from the side, cut grooves in the inside wall of the rotor along the blade line and cut V gates in the blades near the wall. How long the fans will last depends on the fan speed and percentage of solids and hardness of the little projectiles.



This system was designed to remove dust from air cleaners before it reaches the exhausters to save wear on the latter. *A* is the duct carrying coal dust from the cleaners; *B* locates the four cyclones that remove the dust; *C* is the clean-air piping from cyclones to exhausters. This clean air does carry some dust. The exhausters, *D*, discharge clean air to the atmosphere and the remainder of the dust to the small cyclones, *E*. Life of the exhausters has been prolonged four to six times.

ties of fine coal dust, which creates problems of wear in the air ducts, cyclones, blowers and exhausters. While ducts wear along the bottom and very rapidly at elbows and sharp turns, there are other points requiring attention after operation has located them. They cannot be predicted. Guide vanes at elbows and turns increase efficiency and reduce duct wear. "Wear spots," once located, can be protected by bolted or spot-welded liners. The same thing happens to cyclones, which may be bought with liners at the intake and down in the cone. In any case, liners in the vulnerable spots will greatly prolong the life of cyclones. It is worth repeating that the wear in air ducts carrying abrasive dust is erratic and the bad spots must be located after operation has started the wear.

Blower fans normally handle clean air and wear indefinitely. With fans handling dust-laden air it is a different story. In side-intake fans the heavy particles impinge against the inside wall of the rotor opposite the intake, wearing grooves along the line of the blades and cutting "V" gaps in the blades a short distance from the wall. The speed of the fan and the volume, density and hardness of the suspended solids will determine life.

Plant A uses special fans to handle the coal dust from the boxes. As originally installed, rapid wear made repair and renewal cost very high. These units have a double discharge, with the main scroll supposedly practically dustless and a groove behind where the dust is supposed to collect and be discharged through a special exit.

To protect the units a new duct system was installed with cyclones ahead of the fans to remove the dust before it reaches them. This system extends the life of the fan rotors to two years whereas they formerly lasted but a few months. Only a little of the finest dust reaches the atmosphere.

Plants B and C use bags to catch the final fines that get by the cyclones. The first has 80 and the second 160 bags, 40 in a set. At both plants there is trouble with the bags rotting at the bottom connection. At B it is supposed to be due largely to the dampness of the coal. The average life of the bags is about two years.

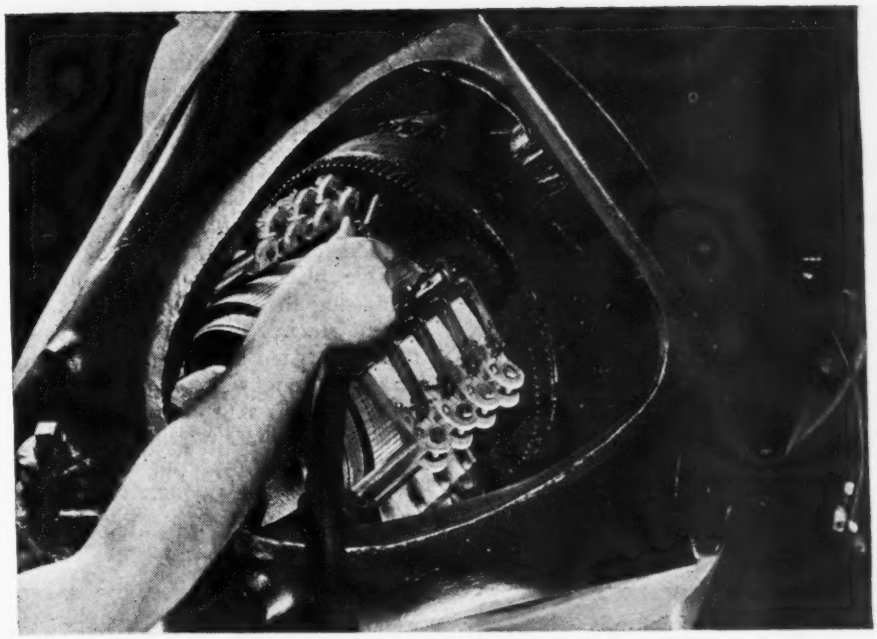
At Mine C the bags are mildew-proofed and fire-resistant but are not proof against rotting. The dampness that causes rot is attributed to a dew-point condition. They are set on top of the building. While protected from the weather they are subject to temperature changes. In a period of four years, 84 bags were replaced—a much better record than at B.

HOW TO CLEAN

Electric Motors, Windings and Insulation

Analysis of Job and Objectives Shows Which Method Will Yield the Best Results—Materials Include Air, Steam, Water and Solvents—Methods of Use and the Precautions to Be Taken Vary With the Type

By D. L. GIBSON
Insulation Engineer
Transportation and Generator Division
Westinghouse Electric Corp.
East Pittsburgh, Pa.



Not more than 40 to 50 lb. of air should be used in removing loose dirt from motor.

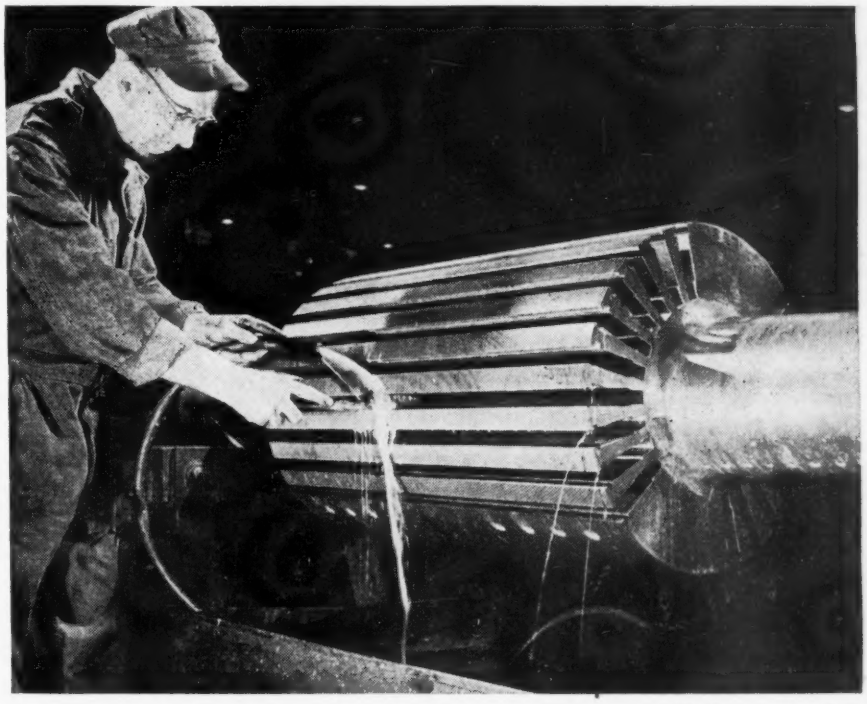
GOOD CLEANING of electrical windings, rotors and stators involves more than wiping off the surface with solvent or removing old coils and scraping the slots free of varnish. Several simple methods can be employed to insure a good job. The method or combination to use depends upon the reasons for cleaning the machine. Money, time and labor can be saved both in cleaning and in subsequent operations if the jobs are analyzed and the proper methods employed.

Machines which are being rehabilitated by another varnish and oven-bake dip require a type of cleaning that will remove grease, dirt and carbon dust but will not damage the insulation. For stators or rotors from which coils are to be removed and then rewound, a method can be used that not only eliminates dirt and grease but also softens the varnish film to facilitate removal of coils and cleaning of vent ducts and frames. Laminations and slots can be cleaned by still another method. In some cases, machines may require special cleaning with water or solvents because of exposure to chemical fumes, salt water or flood waters.

Analysis the First Step

These examples indicate the need for careful analysis of the cleaning problem and then making provision for facilities to do the job economically. Usually, adequate temporary equipment can be installed to take care of special cleaning.

Standard methods of cleaning insulation include: wiping the parts with lintless cloths soaked with solvent;



Solvent and a hand brush are used to clean grease, metal chips and dirt from rotor slots.

blowing the dirt out with air pressure; drawing the dirt off with vacuum cleaning apparatus; spraying or immersing in solvents; and washing with water. Specialized methods include the use of vapor degreasing and the use of the steam "jenny." The methods used will depend upon the varnish treatment of the apparatus and conditions involved.

Machines treated with asphalt-base varnishes cannot be cleaned by vapor degreasing unless complete stripping and removal of varnish is contemplated. Low-powered solvents should be used on asphalt-base varnishes if the film is not to be removed. Synthetic varnishes will stand more severe cleaning methods than asphalt varnishes without injury to the film.

Cores stripped for rewinding may be further cleaned by sandblasting, vapor degreasing or solvent immersion. This discussion applies to machines that may be dismantled to be cleaned, or machines that can be taken to repair shops for an overhaul. The methods detailed in the following do not apply to high-voltage machines (4,000 volts and over). These require special cleaning processes with low-powered solvents.

Blowing out dirt with air at 40 to 50 lb. pressure usually is effective, particularly in inaccessible places. However, air merely removes the loose dirt and does not disturb the embedded material. Cleaning can be done quickly with compressed air, however. The air should be dry and clean and the windings should not receive the full force of the air pressure. Equipment to be cleaned should be given a preliminary going over with air to remove the loose dirt. Care should be exercised in using air to prevent blowing dirt into cracks in the insulation. If vacuum cleaning equipment is available, it should be used, as it does a good cleaning job and in addition does not distribute the dirt around the shop.

Reaching Inaccessible Places

When the accumulation of dirt on the frame and insulation contains oil and grease, an organic solvent will be required to remove it. Solvents for oil and grease can be applied by wiping with lintless cloths moistened with the cleaning fluid. Obviously, this method cleans only the readily accessible places. Pressure spraying or immersing the parts in a bath of the solvent reaches the inaccessible parts. The immersion method entails some hazard caused by the maintenance of tanks of solvents. However, small motors can be easily cleaned by hanging on racks and dipping in solvents.

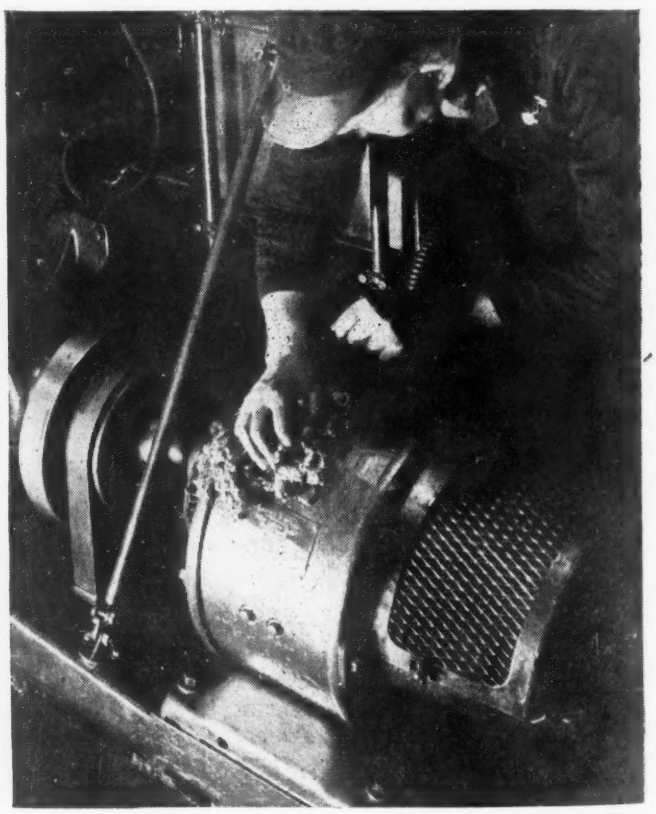
These methods adequately clean the surface of the machine for repairs or the insulation for additional varnish treatment or removal of a few coils. They do not clean out vent ducts, dissolve varnish, loosen coils in the slots or clean slot laminations. The baked varnish film is rarely injured.

In general there are three types of organic solvents in use:

1. Petroleum distillates of low solvency power, such as mineral spirits or a high-flash dry-cleaning solvent known as Stoddard's Solvent or cleaner's naphtha.
2. Petroleum distillates of a medium solvent power, such as naphthenic mineral spirits.
3. Carbon tetrachloride.

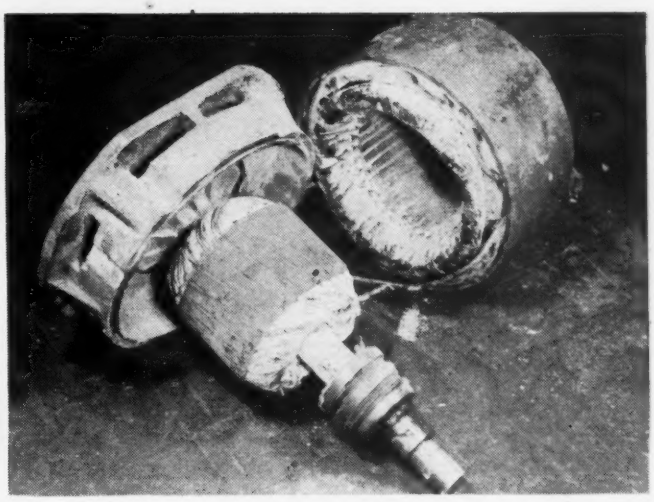
Typical analyses of several petroleum cuts are given in the accompanying table. Solvents are purchased to such specifications. Those for cleaning purposes should have flash points of approximately 100 deg. F. or greater and a solvent power (kauributanol value) in the range of 30-45. Such solvents are inexpensive. They evaporate, leaving little or no residue. It should be remembered that high-flash-point solvents minimize the fire hazard but that they are inflammable. The necessary precautions and facilities should be provided for storing flammable liquids. Usually insurance regulations provide adequate instructions for storage of solvents.

Vapor degreasing depends upon the hot solvent vapors condensing on the parts to wash off the dirt and grease.



Wiping off motors is a housekeeping habit well worth cultivating. It goes far toward keeping motors in first-class shape.

Dirt deposited on stators by flood waters can be removed by immersion in warm running water and the use of a brush.



The contamination of stators and rotors by chemical fumes can be removed by warm running water and brush.

Petroleum solvents are the least toxic but ample ventilation should be furnished and the necessary precautions taken against fire. Carbon tetrachloride is non-inflammable but extremely toxic, and very high in solvent power. It should be used only when a very severe dirt condition is encountered, and then with special health precautions. In some cases carbon tetrachloride is mixed with the petroleum solvents to increase their cleaning power and decrease the fire hazard. A mixture of 50 percent carbon tetrachloride and 50 percent mineral spirits is non-inflammable, but the vapors mixed with the right proportions of air are explosive. In no case should alcohols, benzol or toluol be used. They are severe, will dissolve or soften the varnish, are extremely toxic and are fire hazards. Petroleum distillates of low solvent power will not attack baked varnish films but will dissolve oil and grease and loosen dirt. Some air-drying varnish films will be softened by petroleum solvents.

For some years metal finishing or processing shops have utilized vapor degreasing tanks for cleaning surfaces prior to further handling or finishing with enamel or paint. This method utilizes the principle of condensing hot solvent vapors on the metal to be cleaned, which washes off the grease and dirt through a continuous condensing process. The washing solvent is always clean since it condenses on the surface from a vapor. Solvents used are high-boiling toxic non-inflammable chlorinated compounds called trichlorethylene and perchlorethylene. Sold under various trade names, these compounds are brothers to carbon tetrachloride and are known to the chemist as unsaturated compounds. The degree of unsaturation, or double bond, indicates chemical activity. The chlorine atom gives high solvent power to the molecule, as well as non-inflammability. This combination results in a material which attacks or dissolves greases, oil, dirt, enamels, varnish films and many organic chemicals. However, these solvents have no dissolving effect on shellac and some organic enamel finishes. Trichlorethylene boils at 87 deg. C. (188 deg. F.), while perchlorethylene boils at 121 deg. C. (250 deg. F.).

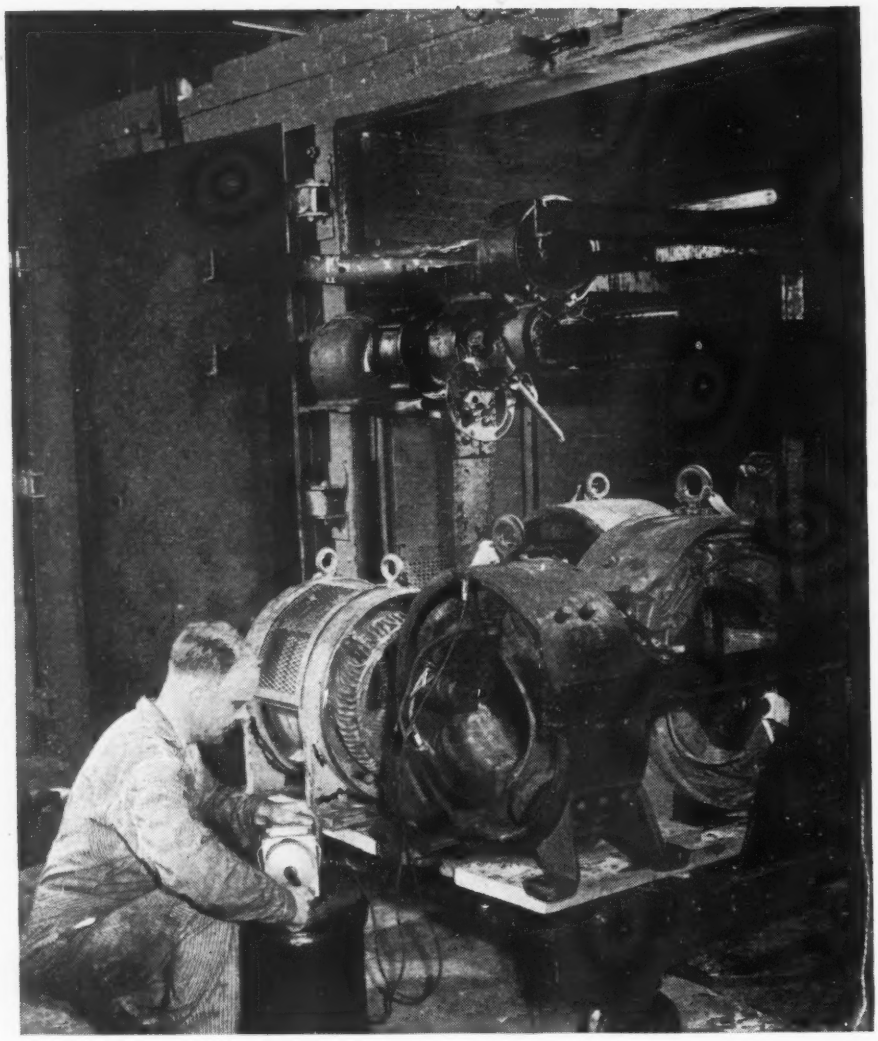
What Degreasing Does

These principles may be adapted to cleaning wound cores or other equipment where all the coils are to be removed, or where equipment is to be rewound and vents and metal thoroughly cleaned. The hot vapors condensing on the equipment attack the dirt, grease and varnish film. The solvent softens and dissolves the varnish around the coils so that stripping is accomplished easily and laminations are not damaged on coil removal. If slots and laminations are to be further cleaned, the core may be returned after stripping for another cleaning cycle. This method is not recommended where only the insulation surface is to be cleaned and the wound core given a coat of varnish and baked. Some use has been made of the process for surface cleaning where the machine has been treated with certain synthetic varnishes and where careful control is exercised in the degreasing process. However, the control must be precise so that the vapors will not soften the varnish film.

The degreasing process is carried out in a tank heated by steam or gas and provided with cooling coils on the inner walls. There are patented degreasing chambers on the market which are furnished and installed by companies specializing in this method. In this operation the cleaning solvent is brought to vaporization or boiling. The vapor rises to the condensing coils, located near the top of the chamber. The apparatus to be cleaned is lowered

Specifications for Standard Petroleum Solvents

Values	Xylene Substitute	Mineral Spirits	Naphthenic Mineral Spirits	High-Flash Mineral Spirits
Sp. gr. at 15.5 deg. C...	0.77–0.80	0.76–0.79	0.81–0.82	0.77–0.79
Pounds per gal.....	6.4 –6.7	6.3 –6.6	6.7 –6.8	6.4 –6.6
A.S.T.M. Distillation, Deg. F.				
Initial B.P.....	290	305	310	325
50% over.....	305	345	340	350
90% over.....	315	370	370	370
Dry point.....	325	395	395	395
Kauri-Butanol Value...	36–47	31–40	42–46	34–36
A.S.T.M. Flash Point, Deg. F.....	85	103	105	115



Measuring the insulation resistance during the baking-out process helps determine the condition of the insulation.

below the vapor line into the vapor, which condenses immediately in a steady stream on the piece. When equipment reaches the temperature of the vapor, condensation stops and the cleaning process is completed.

Surface cleaning by use of hot water under pressure has been successful in some instances. Portable steam "jennies" are available with special jet guns and nozzles to eject hot water vapor at 60 to 70 lb. (nozzle pressure). Such a device heats flowing water and ejects it in vapor form through a cleaning gun or nozzle under pressure. This method is particularly efficient in the removal of dirt, dust, mud or chemicals. Attachments are available to feed so-called neutral soaps or solvents into the vapor stream. The soap emulsifies grease or oils present and makes them easily removable. The use of strong alkali soaps should be avoided, since they injure varnish films and may leave conducting particles on the insulation. The temperature of the water or soap solution should not be above 90 deg. C. (194 deg. F.), and the pressure at the windings not over 25 lb. per square inch. Neutral soaps have little effect on the baked varnish film and insulation. However, the operation should be completed by a rinse in warm, clean water. This method is not an aid in coil removal but cleans the surfaces for further repair or varnish treatment.

Electrical apparatus which has been in flood waters and is clogged with silt and mud or equipment exposed to water-soluble chemicals probably needs to be cleaned by immersion in water. Some chemicals to which modern electrical machinery is exposed are soluble in water and become embedded in grease as a hygroscopic slime. These can best be cleaned by immersing the dismantled parts in running water at 52-57 deg. C. (125-135 deg. F.), scrubbing the metal with brushes and wiping the insulation with lintless rags. After water immersion the machine or parts may be given additional cleaning with a steam "jenny."

With any process where water is used on electrical windings care must be taken to dry out the equipment slowly so as not to damage the insulation by formation of steam. There are three methods of drying winding insulation: (1) internal heat, (2) external heat, (3) combination of internal and external heat.

Shops where electrical machinery is maintained and repaired should have a forced-draft-ventilated oven capable of reaching 135 deg. C. (275 deg F.). It could be used for baking of varnish and the drying of machinery after cleaning with solvent or water. When water has been used for cleaning, it is preferable to dry the windings in an oven. Regardless of the heating method used, it usually is recommended that the first bake be limited to a maximum of 75 deg. C. (167 deg. F.) on the windings, raising the temperature slowly to 110 deg. C. (230 deg. F.) maximum for Class A windings and to 130 deg. C. (266 deg. F.) maximum for Class B windings. Frequent insulation resistance readings should be made and curves plotted for future reference to standardize bakes for certain classes and types of machines. The drying time necessary is determined by the size of the machine, the heating methods used and the condition of the winding.

After the coils have been removed cores can be further cleaned by use of a blast of fine sand applied under pressure. Slots can be cleaned in this manner preparatory to rewinding. However, the operation has to be carefully controlled so as not to burr laminations or remove steel from the punchings. There is some question as to the effect on core losses, but there are reports that this method is being used on certain types of cores. The cleaning is carried out by a blast of sand directed through a hand gun at 75 to 85 lb. pressure (at the nozzle). Cores to be cleaned are placed on a special revolving platform which contains hoppers for the sand. All sand is automatically screened before reuse. The hand gun directs the blast in the slots parallel to the length of the core. This method thoroughly cleans all recesses.

It is not advocated that facilities for such a diversity of methods be kept available. However, apparatus to be cleaned should be analyzed thoroughly and the proper method used to remove the type of contamination. Considerable thought should be given to the type of dirt and foreign matter present. It may be possible that a majority of equipment to be cleaned falls within a certain category and a suitable method can be installed to speed the process. Use of proper cleaning methods can save money, time and labor.

POWER

PRODUCTION HITS A FASTER PACE WHEN EXIDES POWER THE SHUTTLECARS

THERE are no bottlenecks in the modern, mechanized mine. Where flexible, fast-moving shuttlecars are used, car change time is cut to a matter of seconds, and loaders are kept busy all day long. Main line haulage, too, is speeded up, for mine cars are more quickly supplied and sent on their way.

When the motive power for shuttlecars and locomotives is supplied by Exides, you are assured of the high voltage required to sustain uniform speed throughout the shift. And Exide ruggedness keeps them steadily on the job. You can always count on Exides for dependability, long-life and ease of maintenance.

If you wish more detailed information, or have a special battery problem, write to Exide and ask for booklet Form 1982.

ARMY E NAVY

Exide
BATTERIES

THE ELECTRIC STORAGE BATTERY COMPANY, Philadelphia 32
Exide Batteries of Canada, Limited, Toronto

The Foremen's Forum

Not the Stop but the Sudden Fall

NEARLY EVERYONE remembers the oft-told tale of the Irishman who when he was asked if he got his broken leg in a fall replied: "Naw; 'twasn't the fall, at ahl, at ahl; 'twas the sudden shtop when I hit the ground." That Irishman had the facts. But, contrariwise, it *is* the fall of the barometer and not the *conclusion* of that fall that in mine operation really matters. The fall may fill the air of the ventilated mine with methane from the goafs and rooms. Yet, when the lowest point of the barometer is reached, those same sources of noxious air may cease absolutely to contribute any foul air to the passageways, because the pressure will be constant and the goaf air will no longer expand. The conditions may seem to be getting worse and worse, but instead they have been getting better.

It is not the low barometer that results from the fall, however long the low barometer may continue, that floods the roads with methane. As soon as the barometer ceases to fall, the methane tends to stay in the goafs. However, it will be seen later that in highly methanous mines not only is a falling barometer dangerous but also a steady high or low barometer. With a falling barometer, however, the conditions are worst of all.

The chart shows an actual barographic record of the pressures obtaining on April 4, 1945, at a certain point in New York City. It will be noted that on this particular day, not so different from other days, the barometer dropped most slowly at A just before it reached its minimum value. For this reason, the quantity of methane released from goafs and rooms during this period would be much less than in the moments preceding it.

Methane With High Barometer

The rate of fall per unit of time was greater during almost all the rest of the fall than at A. The greatest fall was at *B*, more than half way up the slope of the curve AC. As the speed of emission is proportional to the drop in pressure in a given time, the quantity of methane to handle by reason of the fall of barometer from C to A in this instance would be greater during the high-barometer period than during the period of low barometer. Actually, as barographs approximate sine curves with their steepest slopes at the medium-pressure line, the maximum emission of methane will occur most frequently, but not always, near that line which is *DE* in the illustration. All this is quite contrary to common opinion. Too many believe that what is to be feared is low barometer.

What is really to be dreaded is a sharp lowering of the barometer at any point on the pressure cycle, high or low, and that is one bad feature of the winter. Not only are the mines drier and the coal dust more explosive but the changes in pressure are more violent, and thus the release of methane from its hiding places is more menacing than in the summer.

Too many, believing that low barometer in itself is to be feared, though medium barometer with its maximum fall usually is the most critical time, have lost faith in the barometer altogether as an indicator of methane percentage, whereas the barometer is telling its story unerringly, only it is being misinterpreted by those who try to use it.

A Pathologic Analogy

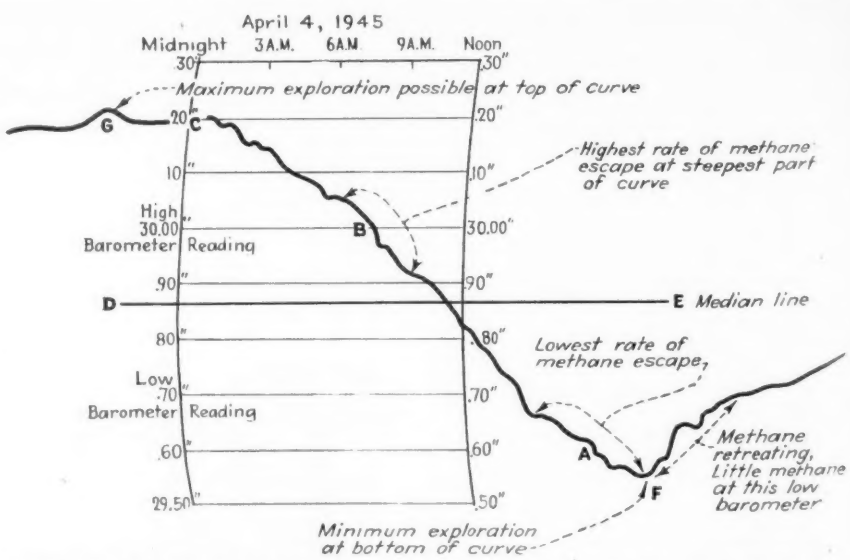
We see the same phenomenon exhibited in regard to the aches and pains of bones and muscles, which probably occur due to the escape of toxins or gases at periods of lowering baric pressure. Everyone wonders at the prescience of those who have such pain. They appear to be able to forecast a storm. They do no such thing. They recognize a lowering of air pressure which occurs long before the pressure actually would be regarded as low. When the storm brought about by the lowered air pressure breaks, the pressure becomes static or actually rises, and the patient is relieved.

Rate Vs. Total Emission

Rate of emission is different from total emission, to be as discriminating in our language as the Irishman. The mine is freest of methane, speaking in terms of weight, when the air of the mine has expanded to its greatest limit; that is, at the time of low pressure or lowest barometer, which is indicated at *F* in the barographic record. This is because the ventilating current during the fall of pressure has swept out the methane that expanded into the headings.

On the other hand, if the mine has long ago been abandoned, this will be the period when the methane will be likely not only to fill the mine but also to flow out at portals and shafts. It is the time when exploration without oxygen apparatus will be impossible.

Conversely, as the air pressure goes up and the barometer reading increases, air enters the mines until finally a point like G is reached, only on another loop or hump than that shown, and maximum exploration will then be possible. Here we are concerned not with rate of emission or rate of recession of methane but with its total quantity, and this is true also when miners are entrapped in the mine. The distance the carbon monoxide will travel toward



Taken from a barographic record of the U. S. Weather Bureau for a certain point in New York City, April 4, 1945. Note the lowest rate of emission of methane in this instance is at the lowest barometer reading and that then the barometer rises and pushes the air out of the headings into the goafs.

BUT **Hiroshima, where millions of ball bearings were stock-piled, was target for the first atomic bomb in history.**

AND **Schweinfurt and the other Nazi ball bearing centers were primary objectives of our bombers in Europe.**

Yes, the heart of *any* nation's industrial might is the ball bearing.

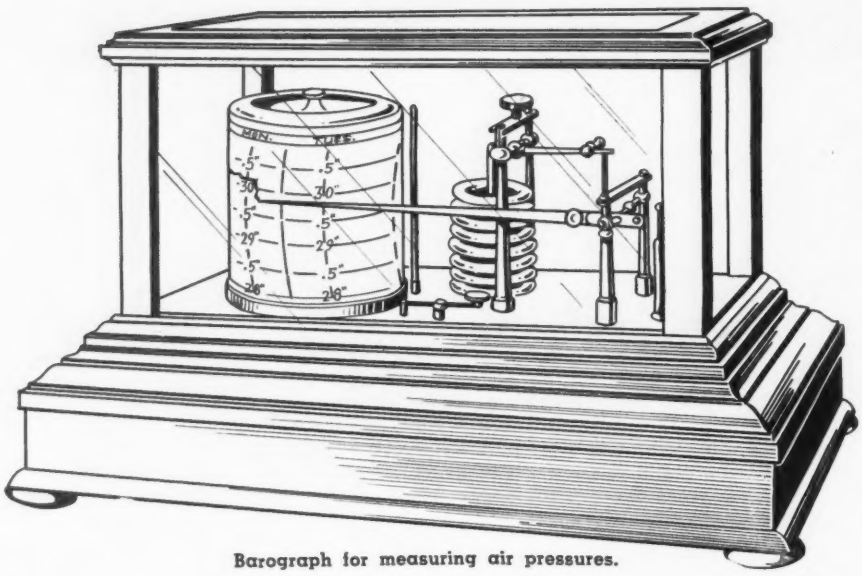
Nothing rolls like a ball. It is nature's favorite, strongest form. Thus, the *ball* bearing is a "natural" for the higher speeds, heavier loads and greater rigidity demanded by today's exacting production standards.

When designing your new machines, take advantage of the creative engineering, technical skill, long experience and precision manufacturing methods of New Departure—the world's greatest maker of ball bearings.

NEW DEPARTURE
BALL BEARINGS

3395

NEW DEPARTURE • DIVISION OF GENERAL MOTORS • BRISTOL, CONN • Branches in DETROIT • CHICAGO • LOS ANGELES and other Principal Cities



Barograph for measuring air pressures.

their hideaway will depend not on rate of pressure increase but on the total increase of pressure.

When in a mine a large volume of methane is evolved, a static barometer, though not as dangerous as a falling barometer, may be quite deadly. With ventilation shut off, a mine producing 5,000,000 cu.ft. of methane in 24 hours will fill completely by its need for space 10,417 lin.ft. of entry having eight 6x10-ft. headings, and that is just a little short of two miles. Thus, a low barometer may do appalling mischief to entrapped men in one day's time if all that methane goes into the headings of the entries, but it may find a place for itself by pushing air or other gas out of the mine by a different route; namely, one by way of the goaf as far as the goaf extends and offers passage, thus leaving areas of breathable air behind.

It must be remembered that, with mines which emit only small quantities of methane, it is good air, and not methane, that is pushed into the goaf by high pressure whenever the barometer rises and whenever accordingly the atmosphere of the goaf shrinks. In such a case, not enough methane is emitted to keep the good air out. Then, when later the barometer falls, the atmosphere of that area expands, and the first effect will be for it, in its expansion, to throw out not methane but some of the good air that has been collecting at its edges throughout the period of rising barometer.

Thus, a fall of the barometer in a mine having a very low methane emission may be relatively harmless, so long as it continues to occur when the barometer is above a minimum, for all the emitted gas will be good air picked up when the barometer was rising and thrown out of storage as the mercury fell.

There are mines, however, where during a rise in barometer (1) enough methane may be emitted from the strata to lessen materially, by its space-filling qualities, the space in the goaf for the entrance of air that the compression otherwise would make available or (2) enough methane to keep any and all air from entering the goaf area or (3) enough even to permit of the emission of methane from the goaf (though in lessened degree) during such barometer rise. In these three cases, the atmosphere escaping from the goaf with any fall in pressures will reflect the nature of these several conditions.

Where, on the rise of the barometer, the methane continues to escape from the goaf, the emission of methane during the entire barometric fall may be measurable in terms of the fall of the barometer per unit of time plus the quantity of methane emitted from the strata during that period. Thus, with a decline in the rate of fall of the barometer, the emission of methane per unit of time may greatly decline, even though the barometer reading will have fallen almost to its minimum.

•

Keep Carbon Monoxide Below 0.01 Percent

Where carbon monoxide is present in the air and so has to be breathed by industrial employees during every working shift for long periods of time, its content should be definitely less than 100 parts in a million or one-hundredth of 1 percent. This is the conclusion and counsel of the *American Journal of Medical Science*, October, 1944. The quantity of carbon monoxide present in the hemoglobin of the blood at the close of any of these constituent periods of exposure may gradually decrease if the exposure is repeated for some months, even though the concentration of carbon monoxide in the air is continued unchanged. The body appears able to adjust itself a little to this change in atmospheric analysis.

After the carbon monoxide has been breathed for a work shift, the proportion of carbon-monoxide hemoglobin in blood may rise to 16 percent, and U. S. Army safety engineers have set the maximum allowable quantity at 20 percent. The hemoglobin of the blood is avid for carbon monoxide. Carbon-monoxide hemoglobin, thus formed, it may be explained, is more stable than carbondioxide hemoglobin and does not become separated from the hemoglobin with each passage to the lungs.

Constant involuntary disturbances in posture and position with unsteadiness of gait were noted in experimental animals after they had been exposed for 5½ hours a day for six days a week and for eleven weeks to an atmosphere containing 0.01 percent of the gas, an exposure that developed daily in their blood about 20 percent of carbon-monoxide hemoglobin. Some of them, tested with an electrocardiograph, manifested gangrene of the muscles of the heart and anoxia (a disease resulting from a lack of oxygen). After the test ended the investigators found that the central nervous system had been affected as in acute carbon-monoxide poisoning but with less severity and in fewer locations. Other findings suggest that when the heart fails to function adequately, brain damage may increase.

•

Sweeping Irregular Roof Free of Methane

Methane in crannies in the roof caused by roof falls and situated on the return side of working men is not likely to cause any trouble so long as it stays there, and there would be little harm if the air were unable to sweep it away, but—and that is the rub—what will happen when the roof falls? It will then be driven down suddenly and in quantity onto the men who are working nearby. That is why a volume of air is needed to sweep fallen areas, so that no large quantity of methane at any time will be present.

The air displaced by a fall will be as likely to travel toward the working areas as toward the goaf. It may even leave the room and become ignited in the heading by a passing locomotive trolley. For the moment, the direction of the regular current if weak is not important, for the fall of the rock will readily reverse it. At the moment when the rock falls, no current, however rapid, can save the day; the reversal will occur in any event. All that can be done is to maintain a strong sweeping current to scour the goaf, so that when the fall occurs the methane will be so diluted as to be innocuous.

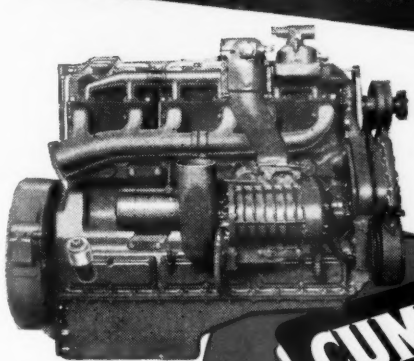
That is why air currents should be rapid and bleeders (crosscuts through the pillar of an aircourse) should be provided opposite the places where men are working, and other bleeders when men are not working should be blanked off by stoppings. Whether these stoppings should be left intact after an area has been completely mined is a question. They will have their effect in luring polluted air to the headings when it is found desirable not to ventilate the mine for fear of spreading carbon monoxide.

Closed bleeders often cause the tidal air to travel roadways instead of being forced by increasing atmospheric pressure into the goaf, where no harm will be done. After an explosion, their opening is often too long delayed, difficult, dangerous or overlooked and then conditions are most unfavorable for the saving of the lives of entombed men.

POWERED FOR higher PROFIT

Consider these advantages in standardizing on Cummins Dependable Diesels for your heavy-duty power requirements—automotive, portable or stationary. Three models—150, 200 and 275 hp—have the same basic design and practically the same mounting dimensions . . . weights as low as 10½ pounds per horsepower . . . many interchangeable parts . . . a single service procedure. Results: in effect, you meet varying power needs with "one engine" . . . you save engine weight and space . . . you reduce parts inventory . . . you simplify the mechanic's job, cut service costs.

CUMMINS ENGINE COMPANY, INC., Columbus, Indiana



CUMMINS Dependable DIESELS

SINCE 1918...PIONEER OF PROFITABLE POWER THROUGH HIGH SPEED DIESELS

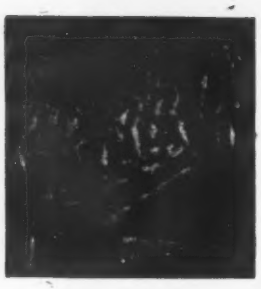
Read the Record

1. Most of the rubber-tired earth and ore-moving equipment on the Mesabi Iron Range—the world's largest—is Cummins Diesel-powered.

2. More than 90% of the long-line, franchise-operated, heavy-duty, diesel-driven trucks in the 11 Western States are Cummins Diesel-powered.

3. In the world's greatest petroleum producing area—the Mid-Continent region—Cummins Diesels outnumber any other make of diesel engine.

4. More yarders, loaders and trucks in the Northwest Woods are powered by Cummins Diesels than by any other diesel.



State-Board Questions

Mine Foremen, Alabama

Analysis Vs. Safety Lamp

Q.—Would you rely entirely on the flame safety lamp when determining the flammable gas content of the air in the return airway of each entry of each split? Give reasons for your answer.

A.—No, I would not rely on flame safety lamps to indicate the quantity of flammable gas in the air at points when the information desired is intended to summarize the general flammable-gas percentage obtaining over large areas, for in such places the air should have no more than ½ percent of methane, and few observers can, with any assurance, note less than 1 percent and then not with any accuracy. The height of the cap of a safety lamp cannot be determined with precision, whereas analyses give the volume of gas with a high degree of correctness. The safety lamp is satisfactory for face readings, because, at the face, as much as 1½ percent of methane is permissible. The limit of ½ percent in the return is fixed with the full conviction that where that much methane appears at that point, a dangerous percentage of methane—over 1½ percent—doubtless will be present in some part of the split.

Well-Ventilated Mine

Q.—When would you consider a mine properly ventilated?

A.—A mine is properly ventilated (a) when the return air contains less than ½ percent of methane, (b) when each man and animal get the quantity of air required by law and when that air contains by volume at least 20 percent of oxygen less than ½ percent of carbon dioxide and no harmful quantity of any poisonous gas, these facts to be ascertained after all the moisture has been removed from the sample of air being tested; (c) when the air speed in each split is not less than 150 ft. per minute or is more speedy than that if, with that speed, the methane is not removed from the split as fast as that gas is evolved, and when no working place contains more than 1½ percent of methane; (d) when provisions are made that the power needed to drive the fan will always be available whether from the provision of two independent sources of power that can speedily be applied or by a secondary fan unit or both; (e) when the fan has proper safeguards against mechanical damage and against the burning of field and armature coils; (f) when an indicator is provided to show whether the fan is running or has stopped; (g) when the fan is housed in a fireproof building; (h) when the fan is so placed that recirculation of air is impossible; (i) when provision has been made for the passage of the qauntity of air that may be needed later when the mine is further developed and/or emits more methane; (j) when the air is not only circulated but carried to every working face; (k) when every possible precaution has been taken to protect the employees in case of the failure of a stopping or door (such as double or emergency doors) or the opening of such a door for an excessive length of time (such as the use of automatic doors or the omission of latches to hold the door open), and (l) when the fan, to keep it out of the direct aim of explosive violence, is located 25 ft. from the line of the airway it serves and is provided with suitable explosion doors.

Only by cleaning up operations promptly in any area once opened can ventilation be kept adequate at reasonable cost.

For Lower Air Speed

Q.—How can air velocity be reduced without decreasing the volume of air?

A.—There are a dozen principal ways of reducing the velocity of air without decreasing its volume:

(1) By providing more intakes and returns in the entry to carry the air to the working places (see Fig. 1) and to facilitate the travel of air through rooms parallel to face entries and from room to room in room entries. It seems strange that rooms in face entries are so seldom thus utilized (see Figs. 2 and 3).

In Fig. 2, the pillars have been left standing in two rooms driven on each side of the face entry, and the pillars in the rest of each butt entry, both in rooms and headings, have been drawn. A large pillar may be left between rooms when driving the third room in the entry so that it will constitute a barrier pillar, permitting the pillars beyond No. 3 room to be drawn without damage to the main entry. These rooms can be kept to serve as additional passageways for air, when more air is needed for the operation of entries farther inby or when the demand for air increases throughout the mine.

To use these rooms as airways, the crosscuts in the side entries are so located that they face the end of a crosscut driven from the end of the room to the return heading of the next inby side entry. The air then will pass both by the intake heading of the main face entry and by these two rooms and instead of two passageways there will be six, three of which will be intakes and three returns.

Why Not All Headings?

It might be objected that these rooms merely replace headings and might be completed as rooms or headings from the first, but in that case three overcasts instead of one would have to be constructed for each butt heading, or air would not be directed to the faces of the butt headings. These overcasts would be likely to add to resistance and to leak. After the pillars in the butt headings outby have been drawn, no such overcasts will be needed, so there is this advantage in delaying the use of the rooms as airways.

The resistance of the mine being low at first, there will be little use for such additional intakes and returns, which can be left unused until the mines become larger. Moreover, the use of such rooms is desirable, if free of gob, for they will carry more air than headings, but in some mines they could not be maintained at reasonable cost. Rooms also should be less expensive to drive than narrow work and

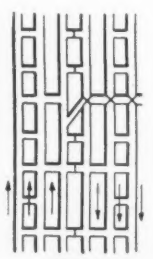


FIG. 1
Have many intakes and returns

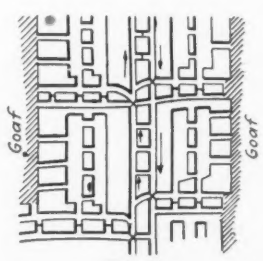


FIG. 2
Keep rooms near entry still standing

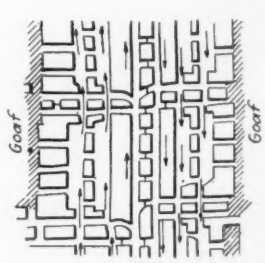


FIG. 3
Convert these rooms later to airways

COALKOTE's "Sealed Protection"... Is the Modern,

Long-Lasting Way To Cut Down on Dust, Dirt, and Freezing

It's overwhelming! More than nine out of ten housewives, and other domestic users of coal, want treated coal; expect to ask dealers for it. These also included homes that burned hard coal exclusively.

Answering a recent survey, made by a leading New York research-bureau, 243 out of 268 users of hard coal said: "Yes! Dust- and dirt-proofing is important."

Among soft-coal users, an even higher percentage — 96% — are in favor of dust-proofing. And, according to this survey, 95% of all coal-users, hard and soft, are willing to pay extra for treated coal.

These facts are the strongest yet, showing the demand for treated coal. To meet that demand, COALKOTE, the modern spray, is now available in unlimited quantities.

COALKOTE seals the small particles to the larger pieces. It practically eliminates dust and dirt. It relieves the housewife of a lot of scrubbing and cleaning.

If you're interested in improving your market-potentials, or in seeing this survey in complete form, or want information on oil-sprays, drop us a line today.

SUN OIL COMPANY • ***Philadelphia 3, Pa.***

Sponsors of the Sunoco News-Voice of the Air — Lowell Thomas

SUNOCO **SUN INDUSTRIAL PRODUCTS**

OILS FOR AMERICAN INDUSTRY

furnish more coal in the early days of development.

Everything depends on the strength of the immediate roof and on the effect of moisture on that roof and on the difficulty of getting first breaks when drawing pillars. In many mines the plan is not feasible, but, instead of rooms, narrow roads can be driven and bratticed. Of course, one room in each butt heading can be used in place of two if need for so many airways is not indicated.

Helps When Air Is Needed

This plan affords a way of satisfying Method 8 (which see) in the list of ways of obtaining sufficient air while using currents having low velocity. The system can be installed also when large barrier pillars have been left alongside the face entry, should shortage of air make such revision of plan necessary.

(2) By having shorter room entries and more face entries, because with many face entries, more headings are available to carry air to the room entries (see Fig. 4).

(3) By splitting the air and thus rendering it unnecessary to compel the air to travel to all the working places in turn (see Figs. 5 and 6).

(4) By making the airways high and wide (see Fig. 7). If great care is not taken in doing this, accidents may occur, for it is often found that the rock has fractured over the coal, which causes falls as soon as the coal is removed.

(5) By eliminating leakage. In a mine with leaky brattices, much air may enter the mine, only a little of which ever reaches the working face. Thus, the air is too speedy at the mine opening or entry mouth and too sluggish in the mine's productive areas.

(6) By having "through" or "one-way" ventilation where possible, thus making intakes out of what were originally returns and eliminating leakage (see Fig. 8).

Less Places Per Entry

(7) By having fewer working places on each entry and thus reducing the quantity of air needed (a) by the miners in each split and (b) to dilute the methane evolved in those splits. It is sometimes not well to put in each split all the men the law allows to be thus located, especially now that, with machinery, fewer men are needed for a given tonnage and more methane is evolved due to greater speed of advance.

(8) By having, as far as is practicable, the capacity for carriage of air of the several entries proportioned to the quantity of air that these entries have or, in the future, may have to carry (see Fig. 4).

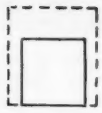


FIG.7 Enlarge cross section

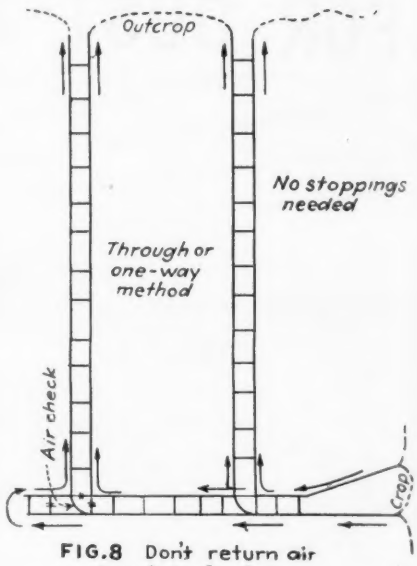


FIG.8 Don't return air to point of entry

(9) By maintaining entries which will serve as alternative routes for air travel.

(10) By avoiding bottlenecks in which the average speed of the air has to be exceeded if the necessary air is to be delivered.

(11) By providing an additional heading where long trips of cars block the main air current. However, such car trips often act as checks to compel air to enter rooms.

(12) By smoothing headings, by keeping them free of fallen rock and coal and by avoiding timbering. Narrowed headings, like other bottlenecks, cause excessive speed.

How Many Splits?

Q.—What governs the number of times the air in a mine can be split?

A.—Air too often is split to such an extent that none of the air currents provided is speedy enough to move impurities such as methane or powder smoke, especially to carry methane downhill at points where the ventilation is not ascensional. Above all, a generous volume of air should be provided where there are pockets in the roof in which methane can accumulate. There may be points where there are few men and no animals, and the specific requirements of the law provide, therefore, for the delivery of only a little air, but there is such a large space for the air to move through that though the legal quantity of air is provided it bypasses the men and the methane, and it might almost as well not be delivered, for they do not and cannot use it. Methane clings to every high point, cranny and crevice and needs a speedy draft of air to compel it to follow the current. Similarly, carbon dioxide seeks every low spot, and a little air will channel through it and leave much of it undisturbed.

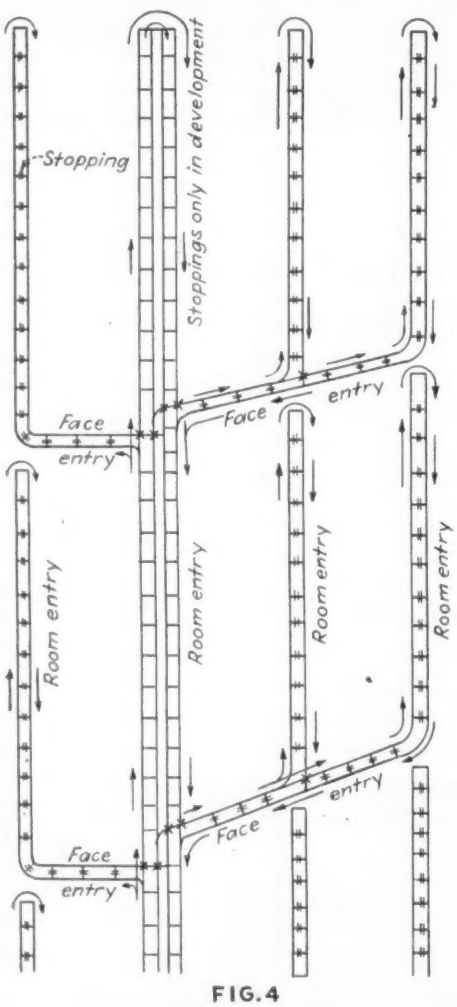


FIG.4

Have frequent face entries and proportion entries to air needs

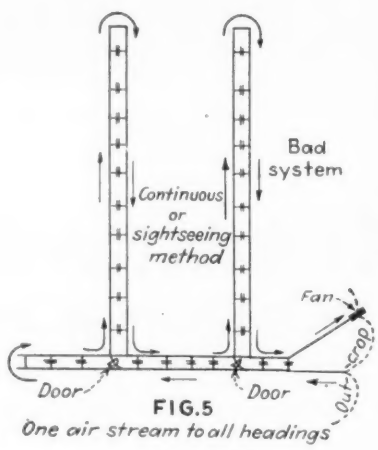


FIG.5

One air stream to all headings

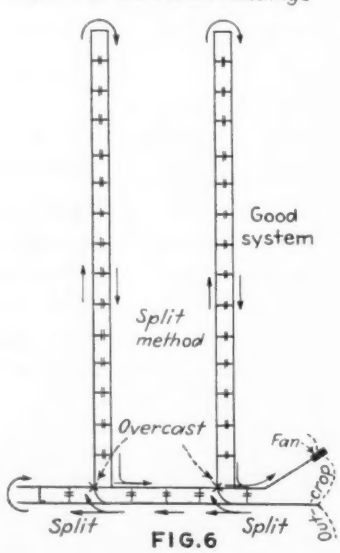


FIG.6

Apportion to side entry its appropriate part of air stream

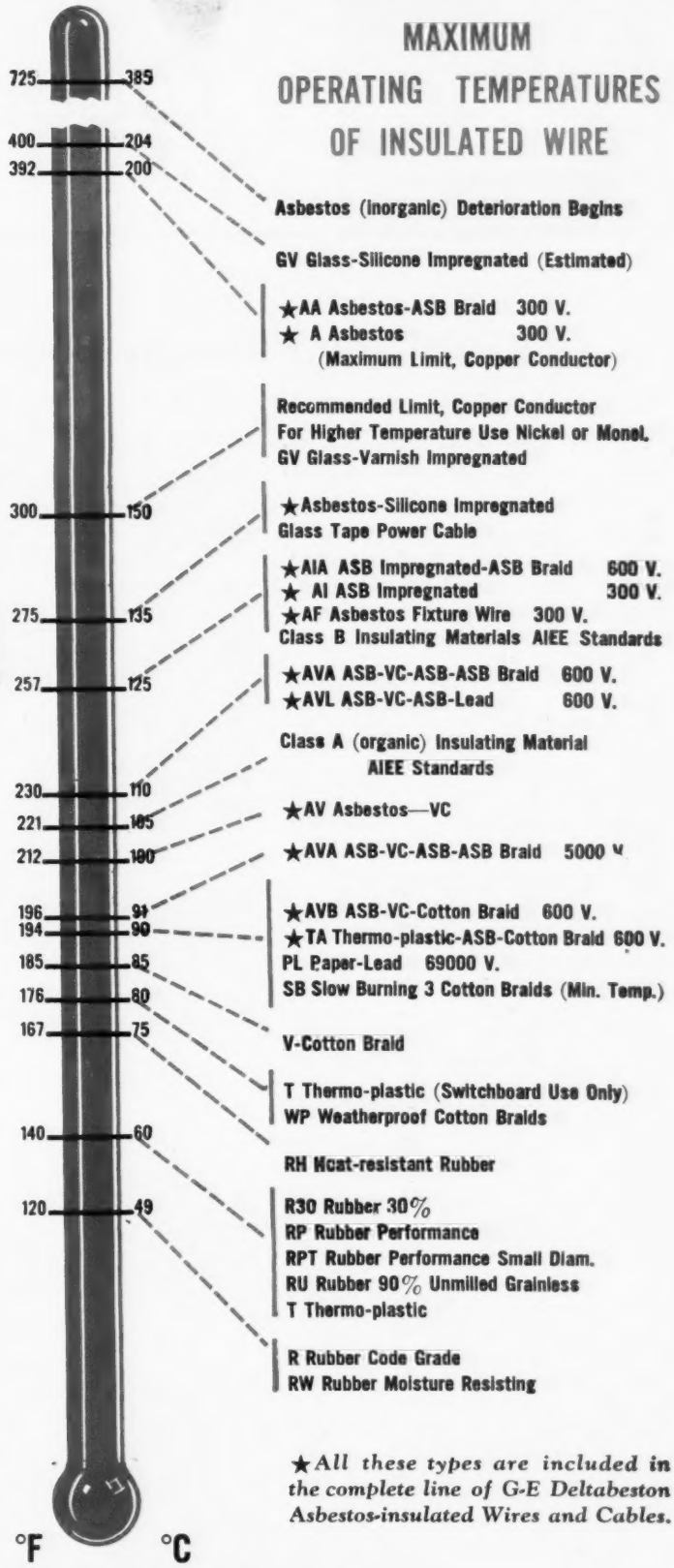
HERE ARE THE FACTS

WHY You Should Use DELTABESTON ASBESTOS-INSULATED CABLES

As operating temperatures on the illustrated thermometer increase, you'll note that asbestos-insulated wires are recommended more frequently than other types. That's why you'll want to investigate Deltabeston for wiring installations exposed to constant high temperatures. These heat-resistant cables are designed for control, lighting and power circuits. Regardless of what type of cable you require, where heat is a problem, Deltabeston fits the job.

● ● ●

The Deltabeston catalog will help you solve your cable problems. For your free copy, write to Section Y1051-10, Appliance and Merchandise Dept., General Electric Co., Bridgeport, Conn. All Deltabeston Wires and Cables are distributed nationally by Graybar Electric Co., General Electric Supply Corp., and other G-E Merchandise Distributors.



★*All these types are included in the complete line of G-E Deltabeston Asbestos-insulated Wires and Cables.*

Hear the General Electric radio programs: "The G-E All Girl Orchestra" Sunday 10 P.M. EWT, NBC. "The World Today" news every weekday 6:45 P.M. EWT, CBS. "The G-E House Party" Monday through Friday 4:00 P.M. EWT, CBS.

GENERAL ELECTRIC

Operating Ideas

Shuttle-Car Battery Boosted While Working

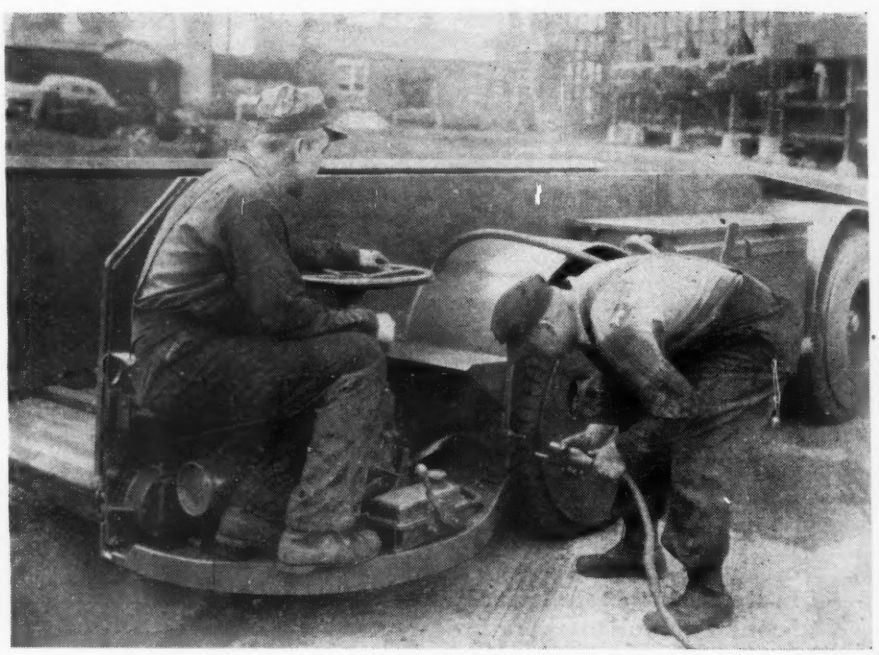
A RESISTOR METHOD for boosting the capacity of a shuttle-car battery as much as 25 percent during a shift, without interrupting its operating schedule, has been achieved by the Peabody Coal Co.'s engineering department, at Springfield, Ill. The resistor, carried on the shuttle car, is used for intermittent charging of the battery at both ends of the run. A central charging set-up, formerly used for boosting the charge of the Exide-Ironclad 300-amp.-hr. battery during the lunch hour, involved too much expense for labor, time and transportation. It has since been superseded by the new charging arrangement.

For some time, because of increased production schedules, the shuttlecar batteries have had to have a supplemental charge or a battery change sometime during the shift. The first plan was to run the cars to a central charging station for a charge during the regular lunch period. Here they were charged through separate resistor circuits from the trolley wire. For a time, this arrangement worked fairly well. However, with a cut in the lunch period and with operators staggering their lunch periods to keep equipment running straight through, there was no time left for mid-shift charging. Another plan of getting the charging done was necessary.

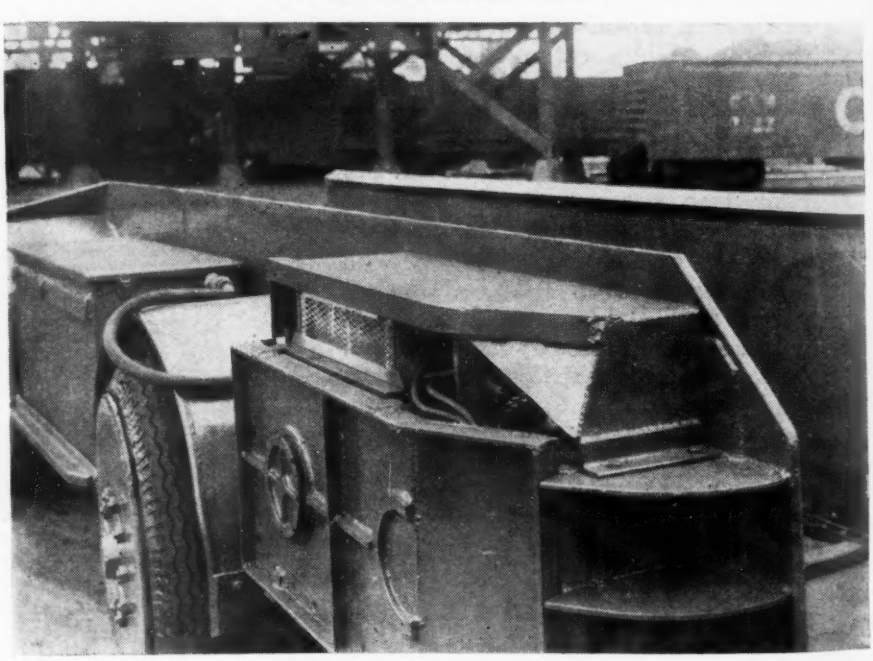
Under this new method, the resistor instead of being located at some point in the territory is carried on the shuttle car. Plug-in connections are made at each end of the run to charge the battery and supply the power for the conveyor drive. At the loading point, the loading-machine helper makes the connection to the shuttle car, using a plug on the loading-machine cable. At the unloading point, the operator of the car makes the connection to a trolley-fed plug without leaving his post. These short spurts of power during the loading and unloading intervals increase the all-day capacity of the battery and supply the power consumed by the conveyor motor. This means that the full charge of the battery can go to propelling the car between the loader and the unloading station.

How much these intermittent charges mean to performance in the course of the shift is indicated by test results. A

(Continued on page 126)



Showing how the plug connection for charging the battery and supplying power for the operation of the conveyor is made.

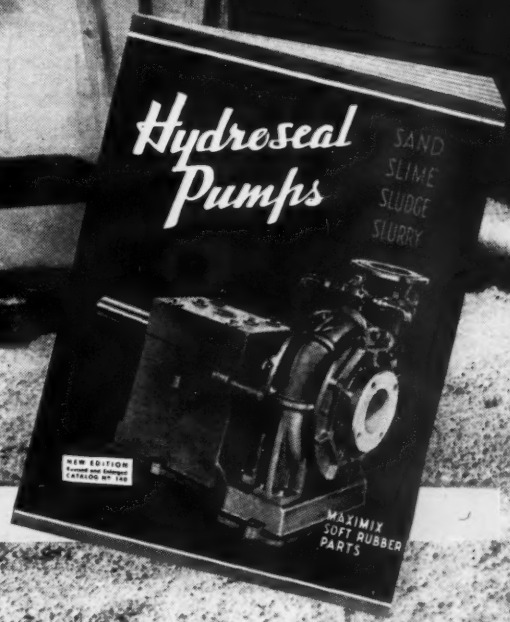


The charging resistor is mounted opposite the operator at the discharge end of the car.

Pumping Coal with HYDROSEAL PUMPS

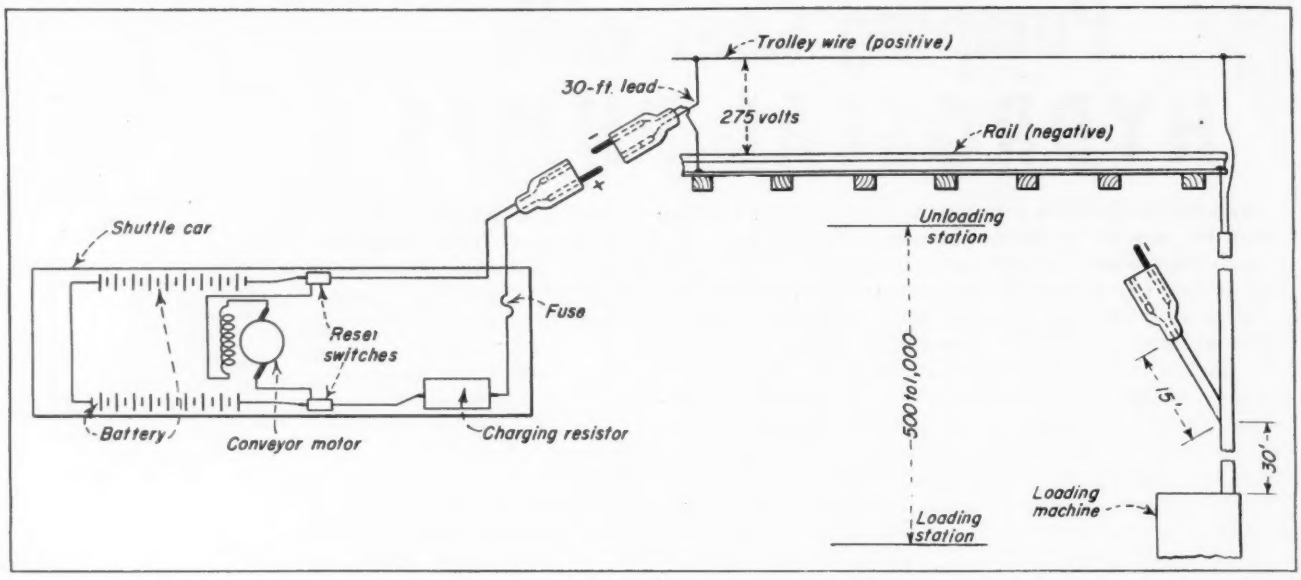
Pumping coal in the moving of storage piles that grow too big or pumping coal from the washer to distant locations for storage, or pumping coal from mine to preparation plant is both easy and economical with Hydroseal Pumps. The discharge line can go anywhere, across roads, creeks, ravines, etc. for distances of one, 5, 10 or 20 miles. No roads to build or tracks to lay [illegible] no empty return trip as with trucks or cars. . . . Photo shows a Hydroseal Pump u[illegible] for moving a coal storage pile. Coal is clammed into the wooden hopper where it mixes with river water via the pipe at the right. Discharge line of pump is buried beneath the coal. Water used in pumping coal can be recirculated if desired and coal may be piled as high as you wish. . . . Ashcolite Abrasion Resistant Pipe reduces maintenance of discharge line to a minimum. The Hydroseal Principle and Maximix Rubber Parts reduce pump maintenance and power costs far lower than you'd expect for such difficult pumping conditions. . . . This is only one of the many coal mine jobs for Hydroseal Pumps. Others include (1) pumping sand and sludge in coal washers, (2) pumping tipple or breaker refuse, silt or culm, to storage pile, (3) reclaiming culm banks, (4) pumping overburden in hydraulic stripping operations, (5) cleaning muck from reservoirs, underground sumps, shaft bottom sumps and air shafts. . . . Send for our 32-page Catalog No. 140 and learn the "latest" about abrasives pumping.

THE ALLEN-SHERMAN-HOFF CO.
231 S. 15TH STREET, PHILADELPHIA 2, PA.
Offices and Representatives in every Coal Mining District in the United States



WRITE FOR CATALOG TODAY

Shuttle-Car Battery Boosted While Working—Cont'd



Arrangement of booster charging circuit showing how plug-in stations are employed.

one-day check was made with one shuttle car using the resistor charging equipment and a second one not using it. Both cars operated under the same conditions and made the same number of trips. At the end of the shift it was found that the shuttle car using the resistor used only half as much from its battery as did the car not employing its resistor charging equipment.

Carrying the resistor on the car makes shuttle-car operation more flexible. As long as the hauls are short (not more than 500 ft. one way) it seldom is necessary to do on-shift charging to get a full day's operation from the battery. But when conditions change and the haulage distances increase, the charging equipment is then ready for immediate use. Thus the battery may be depended upon for a full day's operation under any condition.

The equipment as illustrated is for operation in non-gaseous mines. Its operation introduces no extra operating cost nor does it introduce any delays in schedules. However, it does take advantage of all operating delays, whether at the loading or unloading points, to store reserve capacity in the battery.

A Guyan Type E-1047 resistor (5x10x20 in.) mounted across from the operator on the discharge end of the car, a fuse and three Miller Type 280-U 105-amp. molded-rubber cable connectors are the major items in this charging system. The resistor is wired in series with the 48-cell battery across the 275-volt d.c. supply. This circuit also is in parallel with the motor driving the conveyor. When 275 volts is impressed across the charging circuit the charging rate is about 75 amp. and the drop across the resistor is approximately 147 volts.

In connecting this resistor the positive lead from the Miller plug is connected through an 80- or 100-amp. fuse to the charging resistor. The other side of the resistor is connected to the load side of the overload relay in the magnetic controller. The negative side of the Miller plug is connected to the terminal post marked AS2-BSC-CS2.

The "plugging in" is accomplished by dropping out the reset contactor with the safety button on the control station. The plug connection is made and the reset contactors energized to put the battery on charge. This sequence of operation lets the reset contactors do the actual making and breaking of the electrical circuit and avoids the possibility of establishing an arc at the plug connector.

The car shown in the accompanying illustration also is equipped with sidewall guards for the tires. These guards are cut out of steel plate with a torch and are drilled for attachment with the regular wheel bolts.

Welded Patches Prolong Bumper Life

The repaired bumper is much stronger than the original one.

OLD BUMPERS, when removed and patched, give many years of service, according to Claude Hiner, master mechanic of the D. O. Clark mine, Union Pacific Coal Co., Superior, Wyo.

The repaired bumper shown in the accompanying illustration was snapped as it was leaving the shop. Before it was repaired, it, like many of the others, was badly battered and worn through in two places. After it was removed from another car it was reshaped in the blacksmith's shop.

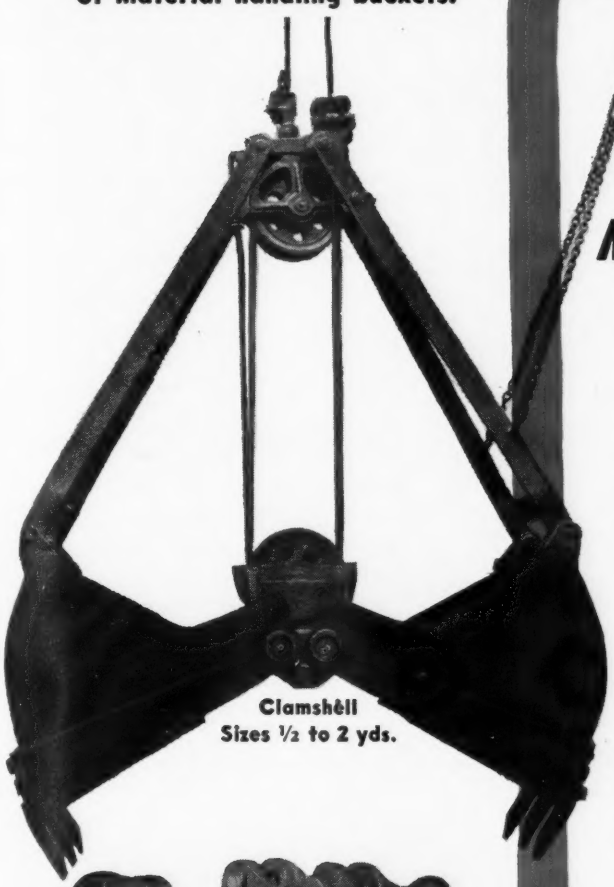
Then in the welding shop a ¾ x 4-in. x 24-in.-long steel bar, already curved to fit the bumper's contour, was tack welded in place. Finally, some half-dozen beads were run around the four edges of the barsteel patch to weld it effectively to the original bumper.

America's most complete line of material handling buckets.

WE BUILD ALL 4 MATERIAL HANDLING BUCKETS

PMCO ALL PURPOSE

- SHOVEL
- PULLSHOVEL
- DRAGLINE
- CLAMSHELL



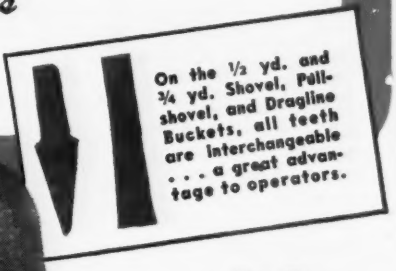
Clamshell
Sizes ½ to 2 yds.

We build a wider and more complete line of material handling buckets than any other manufacturer. Volume production methods enable us to build a better bucket with amazing economies in manufacturing.

FRONTS, BOTTOMS, SCOOPS, and teeth, shown in red on buckets, are 14% manganese steel developing up to 120,000 tensile p.s.i. for long service life and hard abuse.

Experience Counts

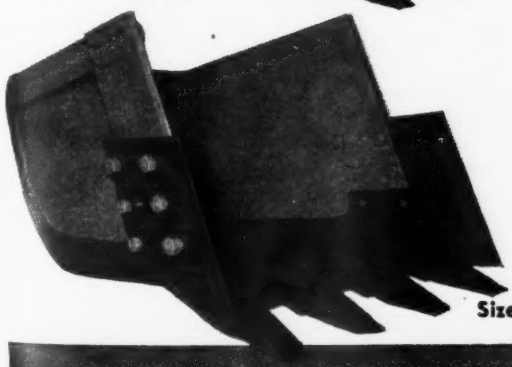
See your shovel engineer or equipment dealer about PMCO Dippers and Buckets.



On the ½ yd. and ¾ yd. Shovel, Pullshovel, and Dragline Buckets, all teeth are interchangeable . . . a great advantage to operators.

Shovel
Sizes ½ to 18 yds.

Dragline
Sizes ½, ¾, 1, 1½, 2, 2½ yds.



Pullshovel
Sizes ½ and ¾ yd.

Quality Since 1880

PETTIBONE MULLIKEN CORP.

CHICAGO 51, U. S. A.

WE OPERATE THE LARGEST AND MOST COMPLETE MANGANESE STEEL FOUNDRY IN THE UNITED STATES.

Gage Measures Pressure in Air Hose

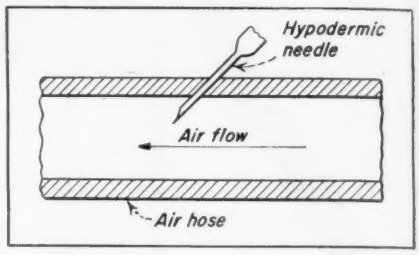
How the gage looks when the protective cap has been removed.

A COMPACT GAGE equipped with a needle to pierce the rubber hose helps foremen keep an accurate check on the air pressures at the working faces inside the collieries, declares F. Edgar Kudlich, special engineer, The Jeddo-Highland Coal Co., Jeddo, Pa.

The illustration shows a U. S. Gauge Model AD-10294 gage equipped with a Beckton-Dickinson No. 16 ¾-in.-long hypodermic needle. The gage has a 2-in. dial graduated up to 160 lb. A polished metallic screw-on cap protects the rather delicate needle when the gage is not in use.

This instrument can be used to measure the pressure in the hose line while the air drill is being used, thus providing an accurate check on the pressure under actual operating conditions. All bother of providing fittings is eliminated. To gage the pressure, the cap is removed and the needle thrust through the wall of the hose, being careful to insert the needle at a rather acute angle in the direction of the flow of air.

The fact that each foreman is provided with a gage and actually does the measuring himself, causes him to take more interest in the condition of his air supply.



The hypodermic needle is inserted in the hose at a rather acute angle in the direction of the air flow. This permits the air to better seal the opening after the needle has been removed.

Gate in Hydro-Separator Saves Coal From Refuse

NOT LESS THAN 10 tons and probably as much as 25 tons of coal per day is saved at Lindley mine, Pittsburgh Coal Co., Cannonsburg, Pa., by an auxiliary gate added to the primary box of the hydro-separator. The idea was originated by S. A. Miller, production control department, and the installation was made under his supervision. The object of the gate, which is manually operated, is to maintain the bed of coal and refuse at normal thickness in the primary box after stopping the washer. Thus when the washer is restarted and the auxiliary gate opened at the proper time, washing is resumed immediately at full efficiency. Without the auxiliary gate there is a delay before the refuse bed builds up to a thickness that prevents loss of coal. The saving made by the device depends largely on the number of times the washer is stopped during the day.

The drawing is schematic. Instead of the auxiliary gate lever being as shown it is on the opposite side. It extends over the float to a point only a few steps from the pushbutton-control panel.

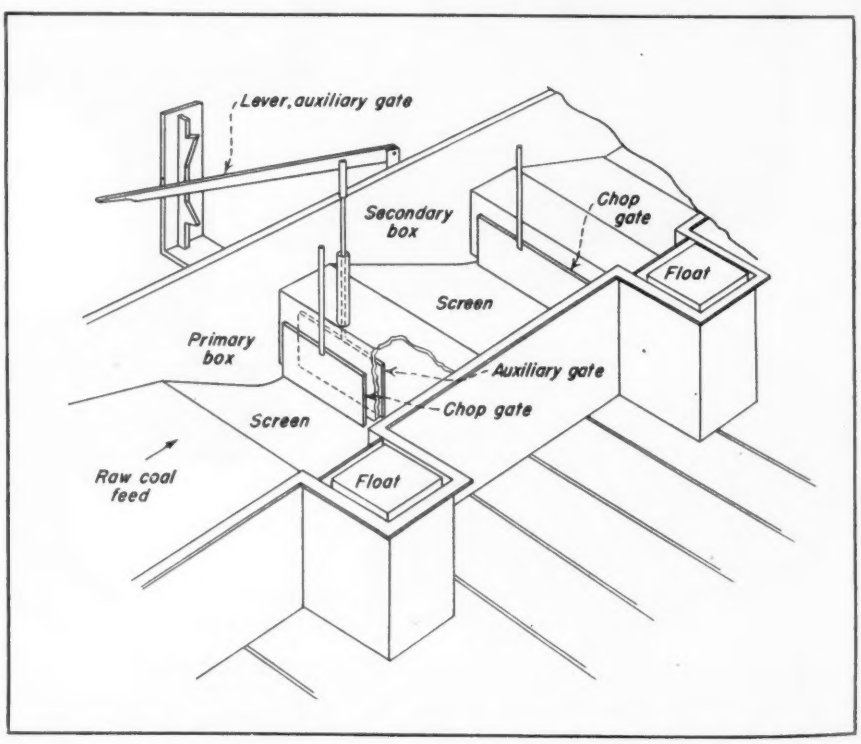
To determine the savings, thirty 45-lb. samples were taken by diverting the complete refuse discharge (4x¾ in.) into a sample pan. Float-and-sink tests on the samples were made at 1.60 specific gravity.

Before installation, six samples showed an average float at 1.60 gravity of 2.9 percent during steady operation. Nine samples taken immediately after starting showed an average of 24.2 percent float.

After installation of the auxiliary gate, six samples showed an average of 5.1 percent float during steady operation, and nine taken immediately after starting showed an average of 4.1 percent.

The steady operation figures of 2.9 and 5.1 are considered as checking fairly close considering the few samples taken.

While the auxiliary gate closes tightly against the bottom, the chop gate, if closed manually by forcing the float mechanism, would close only within a few inches of the bottom. For that reason and because the float had to be held in the closed position during the stop, the original equipment did not afford a satisfactory means of holding the bed.



In stopping, raising the lever forces the auxiliary gate tightly against the bottom and holds the refuse bed to normal thickness in the primary box.

When the Powellton Coal Company decided to begin operations in Logan County, W. Va. there was no question as to mine car bearings. The officials of this new and important organization specified Timken Bearing Equipped mine cars because of their long and favorable experience with them at other mining properties.

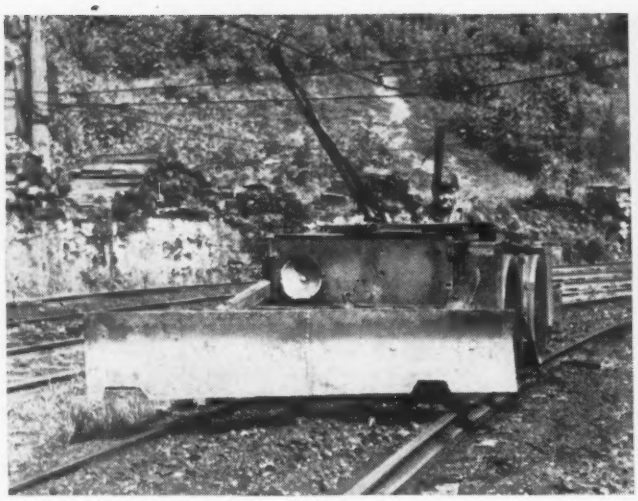
Shown in the photograph is a completely Timken Bearing Equipped train emerging from the Powellton Coal Company's Jane Ann No. 2 mine at Mallory, W. Va. The mine cars were supplied by Enterprise Wheel and Car Corporation, Bristol, Virginia-Tennessee, when the mine recently went into production, and they are shown being hauled by a Jeffrey 16-Ton Tandem Locomotive equipped with Timken Bearings throughout — journals, armature and back axle

The performance record of Timken Tapered Roller Bearings in mine cars during the last 25 years has never been even remotely approached by any other anti-friction bearings ever used in mine cars. Make sure you have Timken Bearings in your cars —with the trade-mark "TIMKEN" stamped on every cup and cone.

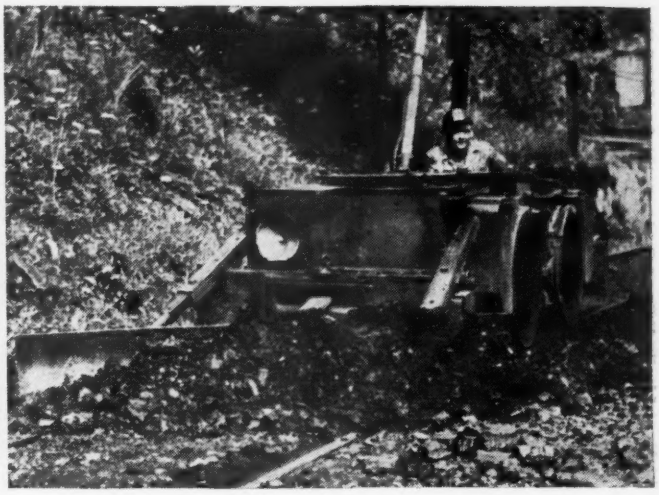
THE TIMKEN ROLLER BEARING COMPANY, CANTON 6, OHIO

TIMKEN
TRADE-MARK REG. U. S. PAT. OFF.
TAPERED ROLLER BEARINGS

Locomotive With Bulldozer Cleans Track



Blade in raised position showing notches for the track rails.



How the blade operates in track cleaning.

A SIMPLE DEVICE is now facilitating track cleaning at mines of the Eastern Coal Corp., Stone, Ky. This device was designed and is being effectively used under the direction of C. B. Morrison, mine foreman, and George Dalton, mine electrician, Nos. 1 and 11 mines, Hardy, Ky.

Messrs. Morrison and Dalton equipped a mine locomotive with a bulldozer blade as shown in the accompanying illustrations. The blade is adjustable to any desired angle with the roadway so that all coal and spillage scraped out of the track is deposited on the side, making it easy to load into mine cars whenever convenient. The blade originally was raised and lowered at will by means of manually operated screws. In the early experiments, however, difficulty was experienced in such raising and lowering, which eventually led to the addition of a clutch, reel and cable which have materially simplified track cleaning.

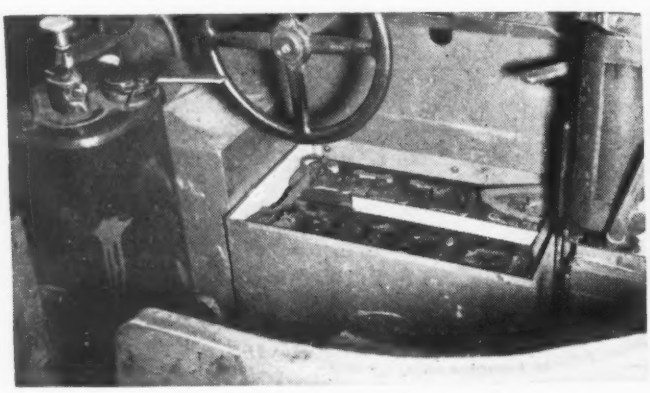
Using this device, one man can now clean more than a mile of track in a single shift.

32-Volt Control Cures Braking Trouble

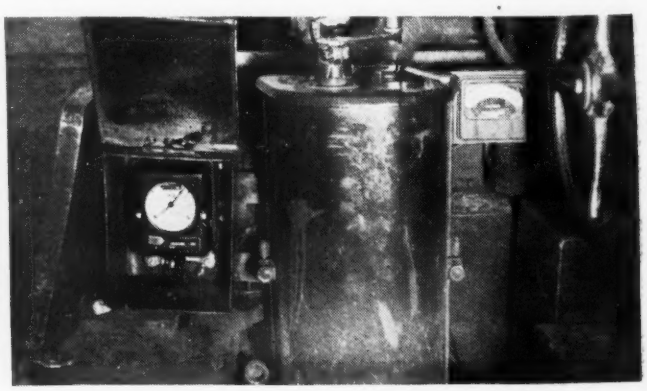
CONVERTING the 250-volt locomotive controls from trolley supply to 32-volt battery operation, reports Guy L. Stevenson, general chief electrician of the Union Pacific Coal Co., Rock Springs, Wyo., has eliminated inability to switch the controls over electrically for dynamic braking at a time when there is a power outage on the trolley system.

Some of the component parts required for making the change in the control circuits are shown in the accompanying illustrations. All the 250-volt coils for the fully magnetic 10-point all-parallel-operation 15-ton General Electric locomotive were replaced with 32-volt coils. In the motorman's compartment is the 32-volt Type KX-76 Exide-Ironclad 16-cell 56-amp.hr. storage battery for energizing the circuits. To the left of the master controller is a Sangamo ampere-hour meter protected by a special metal case. Elsewhere about the locomotive's frame are charging resistors and fuses. The ampere-hour meter, mounted in a special case alongside the master controller, is used to determine the trickle charge to the battery.

Making the control circuit self-contained—i.e., independent of trolley voltage—permits the motorman to exercise full control over the dynamic-braking facilities at all times. Two such conversions have been made on 15-ton locomotives under the supervision of C. L. Kerr, transportation engineer, General Electric Co. (Denver). The Reliance mine has one unit and the Stansbury mine the other.



The 32-volt control battery does not rob the motorman of any needed space.

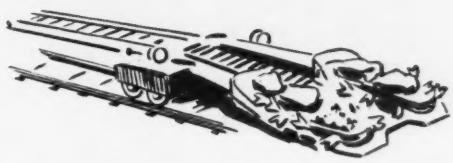


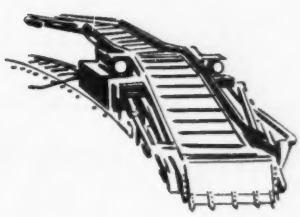
The ampere-hour meter for the control battery is to the left of the master controller.

LUBRICATION ENGINEERING . . . LUBRICATION ENGINEERING . . . LUBRICATION ENGINEERING . . . LUBRICATION ENGINEERING . . .

Cut loader maintenance with "tailored" lubrication

fitted to the age and condition of your loaders





WHAT lubricant to use? How much? How often? Perhaps you've answered these questions before, but the *right* answers are not the same today as when your equipment was new. They're *not* the same as they were before your loaders were called on to take the punishment of producing wartime tonnages.

There's where Standard's Lubrication Engineering can help you—by answering these questions now—by accurately matching lubricants and lubricating methods to your present needs. Here's what this engineering service offers you.

Standard Oil Lubrication Engineers have a complete line of Superla Mine Loader Lubricants for loaders requiring thickened oils. There are six grades to handle the wide range of operating conditions found on various makes and sizes of loaders. Each grade provides the lubricating quality needed regardless of age of equipment. All are designed to minimize overheating, leakage, wear, and parts replacement.

A Standard Oil Lubrication Engineer can analyze your operating conditions, recommend lubricants that are fitted for them, and help you plan new and faster lubricating methods and safe lubricating schedules. Call the local Standard Oil Company (Indiana) office, or write 910 South Michigan Avenue, Chicago 80, Illinois, for the Lubrication Engineer nearest you.

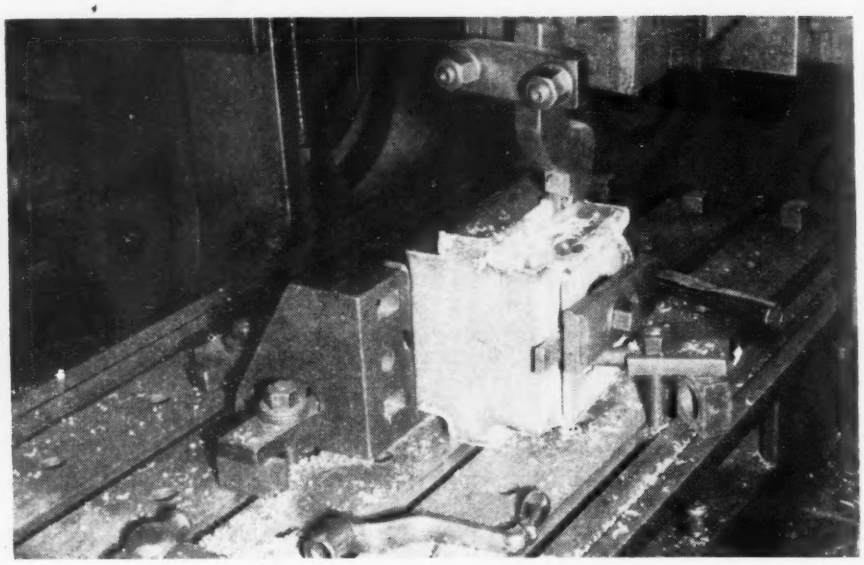
Buy and hold more Victory Bonds

STANDARD OIL COMPANY (INDIANA) STANDARD SERVICE

★ LUBRICATION ENGINEERING

Welding Reconditions Journal Boxes

The cast-steel journal box is at the left and the cast-iron at the right.



The projection on the journal box is given a slight taper on the shaper.

WORN JOURNAL BOXES are restored to their former dimensions by welding at the same time the locomotive is being rebuilt in the Drifton shop of The Lehigh Valley Coal Co., Drifton, Pa.

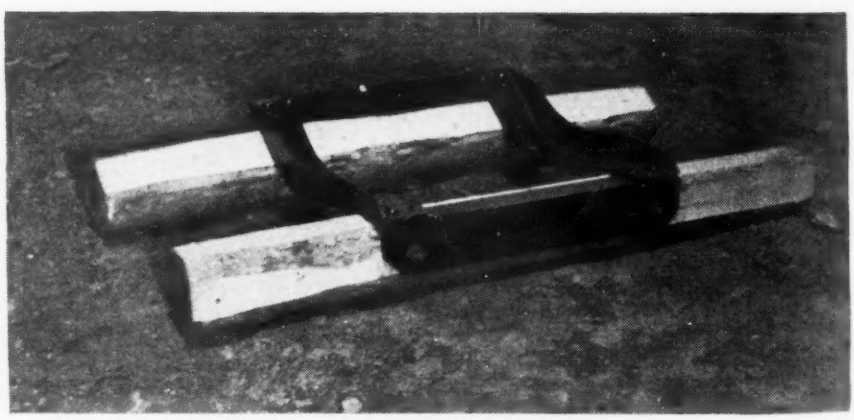
The journal boxes, both cast-iron and cast-steel types, shown in the accompanying illustrations, are built up and machined to their original dimensions. The cast-iron boxes are built up by brazing with an acetylene torch, while the cast-steel ones are either brazed or arc welded.

In machining some of the cast-iron boxes the face of the projecting section (face perpendicular to the line of the axle) is given a slight slope or taper each way from the short straight section in the center. This facilitates the movement of the journal box in the guides and improves locomotive performance.

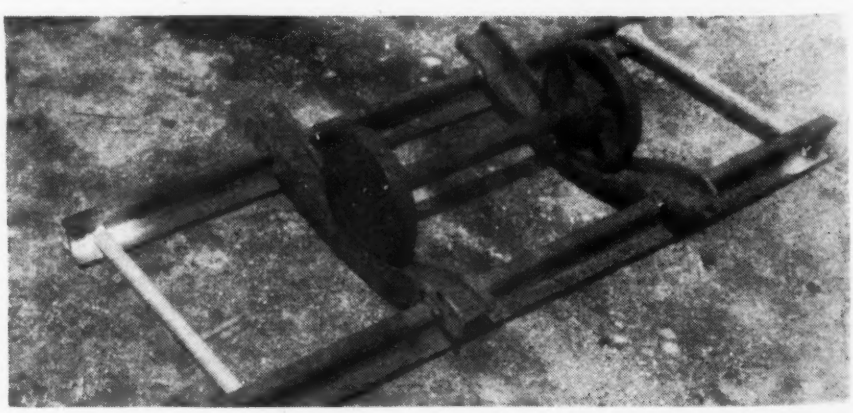
New Trough Support to Last Longer

A NEW METHOD of constructing a shaker trough support, says Raymond Dupont, master mechanic of the Reliance mine, Union Pacific Coal Co., Rock Springs, Wyo., is expected to cut down the number of replacements needed.

The new model, shown in an accompanying illustration, is fabricated with 20-lb. rails and pipes for braces—all arc welded. The curved sections are heated in the forge and shaped in the power hammer on a special die. The new shaker trough support is several times heavier than the old one and considerably more rigid.



The old support was mounted on timbers.



The new support is completely arc welded.

Gar Wood Cable Dozecaster speeds coal stripping operations.

Efficiency Boosters for Open Pit Mining

GAR WOOD ROAD MACHINERY

WITH ALLIS-CHALMERS DIESEL POWER

The increasing use of Gar Wood earth moving equipment in open pit mining is one of the highlights of present trends toward greater efficiency in the production of coal and ores.

A large and steadily growing volume of Gar Wood Hydraulic Bulldozers and Trailbuilders, Cable Dozecasters and Scrapers is being used to boost the productivity of drag lines, power shovels and trucks. These Gar Wood units speed up the moving of overburden—clean surfaces of coal seams—level off spoil—build roadways so trucks may roll at full speed. Rugged, dependable and trouble-free, Gar Wood equipment is particularly well adapted to mining operations, as shown by repeat order after repeat order from satisfied users. Boost your production efficiency this proved way. Order Gar Wood Road Machinery from your Allis-Chalmers dealer.

20 cu. yd. Gar Wood Cable Scraper moves overburden.

GW ROAD MACHINERY
Is Sold Through
ALLIS-CHALMERS
Dealers Everywhere

ROAD MACHINERY DIVISION
GAR WOOD INDUSTRIES, Inc.
DETROIT 11 MICHIGAN

OTHER PRODUCTS OF GAR WOOD INDUSTRIES INCLUDE HOISTS AND BODIES • WINCHES AND CRANES • TANKS • HEATING EQUIPMENT • MOTOR BOATS

Portable Curtain Speeds Ventilation Control

How the curtain bar is held firmly against the roof by timber jacks.

To conserve the fireboss' time in keeping curtain installations apace with the rapid advancement of entries a portable brattice is used at the Oliver Coal Co., Somerset, Colo. The idea was suggested by Albert T. Wiley, section foreman.

The brattice, illustrated in the accompanying cut, is used on the haulageway where shuttle cars must travel to and from the loading point. The brattice cloth is fastened with wood cleats to a 4x4-in. sawed timber. The timber is held in place against the roof by two timber jacks.

When a crosscut is holed through, the screw jacks are released and the brattice is taken down. After the curtain is rolled up on the 4x4 it is carried forward to the next location and reinstalled. Two men now do a job in 10 to 15 minutes which formerly required an hour and a half of the fireboss' time.

Not Necessary

So often the remark is made, "I don't get time to visit other properties—even the neighboring mines. Yet I'm sure that I should know about the new and interesting ideas they must be using." Well, these are busy days, but Coal Age proposes to save you time by telling you about new and tried ideas in this department. You won't need to stop your work or make the trip. You can get the idea right in your easy chair at home. But to round out the picture we need your cooperation. Won't you send in that mechanical, electrical, operating or safety idea you are so proud of? Include a sketch or photograph if it will help to make it clearer. For each acceptable idea Coal Age will pay $5 or more on publication.

Locomotives Given Operating Tests Without Moving

On the trunnions to illustrate the testing position. Grease on the journal-box covers give away the fact that this locomotive has just arrived and has not been overhauled.

Speed and loads show up trouble in overhauled machinery which under mild test appears to be O.K. Accordingly it is the practice in the Library (Pa.) shop of the Pittsburgh Coal Co. to place a rebuilt locomotive on trunnions, where, with its frame remaining stationary, its motors and trucks can be operated at full speed and the effect of full load for short periods obtained by applying the brakes. Not only are the motors, controls and wiring tested for proper connections and capacity but the brakes also are checked and adjustments made so that they work properly with any degree of application.

The four pairs of trunnions (12-in.-diameter rollers) have grooves to accommodate the wheel flanges. The trunnions are portable; that is, are picked up by a crane and set back out of the way when no testing is going on. They are not fastened to the floor and yet there is no tendency for them to move out of place.

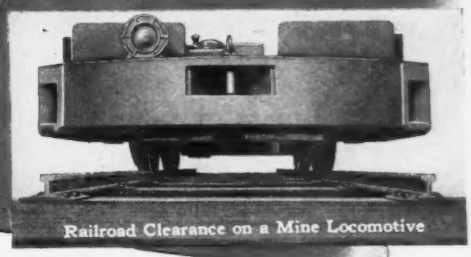
Even three-truck 25-ton locomotives are tested using only the four pairs of trunnions. With this larger locomotive the trunnions are placed under the end trucks and the journal boxes of the center trucks are blocked up.

A locomotive is run a total of about an hour in making the series of tests on each operating point of the controller, forward and reverse. In the case of the Pittsburgh Coal Co., where the shop is a central unit for a number of mines and most of the locomotives are shipped in by motor truck, it is important that they go out as near perfect as possible.

The use of trunnions is not a new practice in the Library shop. In fact, the trunnions pictured have been in use there for about 20 years. They have plain bearings but it is the intention of the shop officials to fit them with roller bearings as soon as time and materials permit. The locomotive on the trunnions in the illustration is an 8½-ton General Electric HM-831 flameproof type with cable reel.

WORM'S EYE VIEW

OF THE NEW WESTINGHOUSE 26-INCH LOW LINER



Railroad Clearance on a Mine Locomotive

Electrification of mine equipment—the quickest means of getting "more coal per hour"—has been the responsibility of Westinghouse engineers for many years. Their background of "on-the-job" knowledge and experience assures the purchaser of Westinghouse Mine Locomotives of:

More coal per hour . . . 100% performance, day in and day out . . . under grueling operating conditions, safeguarded by carefully planned construction features.

Service and parts as near as your telephone . . . Westinghouse Maintenance Service is at the command of mine operators.

For complete proof examine this 'Worm's Eye View' of the Westinghouse Low Liner . . . and consult your Westinghouse office, or write Westinghouse Electric Corporation, P. O. Box 868, Pittsburgh 30, Pennsylvania.

J-15113

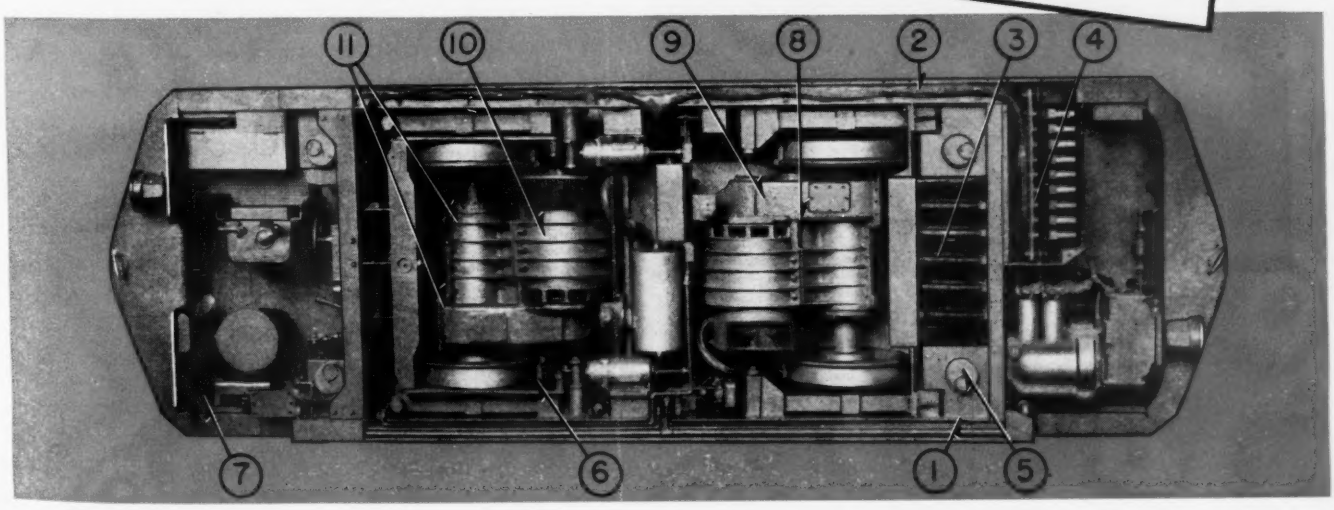
CONSTRUCTION FEATURES

1. Piping laid in trough on top of side frame with free access to every union, cock and joint.
2. Wiring enclosed in hose—placed in trough of side frame.
3. Resistor mounted in one accessible frame—reducing wiring to minimum.
4. Pneumatic contactors mounted adjacent to, but well protected from resistor.
5. Sand boxes with capacity normally found on higher locomotives.
6. Solid brake pull rods—instead of chains.
7. Side frames and bumpers are held together by tapered, reamed driven-through bolts.
8. Motor and drive unit mounted in same gear casting.
9. Gearing of spur design—shafts mounted parallel to motor armature shaft.
10. No external couplings or drive parts. All wearing parts internally mounted and continuously lubricated.
11. Complete motor and gear assembly easily removed in same manner as axle-hung motor.
12. All equipment on locomotives accessible without removing adjacent parts.

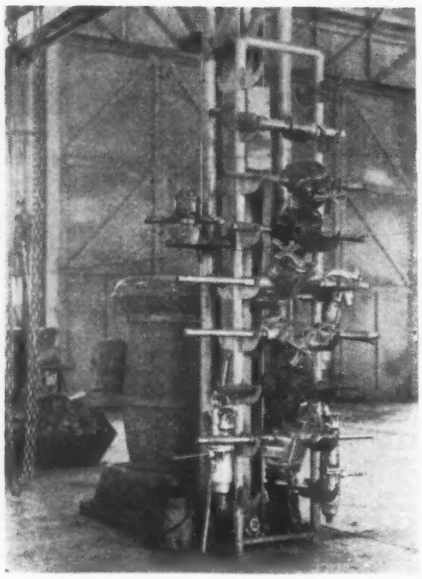
Westinghouse

PLANTS IN 25 CITIES . . . OFFICES EVERYWHERE

MINE LOCOMOTIVES



Air-Driven Tools Occupy Special Rack



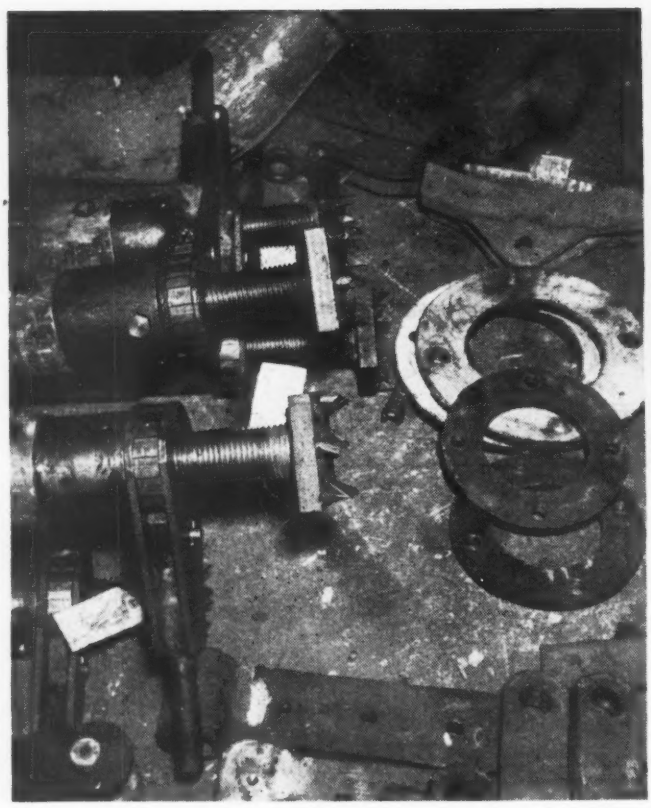
A HOMEMADE RACK serves as storage space for all the air-driven tools in the main machine shop of the Northern Illinois Coal Corp., Wilmington, Ill.

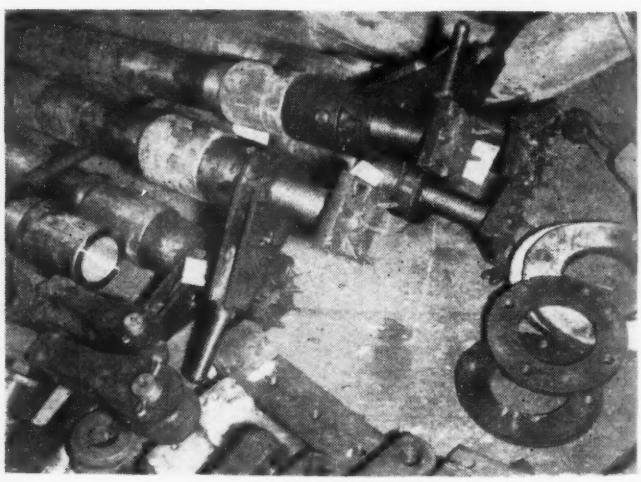
The rack, shown in the accompanying illustration, was made from a few discarded boiler flues and torch-cut scraps of steel plate, all fabricated with a few hours of arc welding. It is attached to a column which helps support two of the three overhead cranes of the shop. It not only is out of the way but takes up little floor space and is convenient to the heavy work that is done nearby.

The fact that only air-driven tools occupy the rack and that they occupy a specific place when not in use accounts for the elimination of time lost in chasing about the shop for a drill, reamer or hammer.

The air-tool rack was fabricated in the machine shop.

Scrap Steel Improves Swivel Jack





Each roof plate is provided with nine triangular pieces of the scrap steel.

The projections, made from S.A.E. 1045 carbon steel, wear well.

SCRAP PIECES of steel from homemade conveyor links help improve the anchoring qualities of swivel jacks used in shaker mining, reports Johnstone Campbell, superintendent, Drifton shop, The Lehigh Valley Coal Co., Drifton Pa.

The swivel jacks, shown in the accompanying illustrations, have had corners (trimmed from conveyor links fashioned in the shop with an acetylene torch) welded on the 5x5-in. roof plate. Nine of the triangular pieces of steel, with the vertical side to the outside edge of the plate, have been welded to each plate. This practice has been in existence at the Drifton shop for several years and none of the jacks thus altered has had to be repaired.

SPEED UP PEAK LOADS —GET LOWEST COSTS!

TOP-QUALITY THAT *DELIVERS* COST-SAVING EXTRA SERVICE!

General Off-the-Road Tires are engineered to handle heaviest hauling at speeds that pay dividends in *extra profits!*

Special tread patterns provide maximum traction and anti-skid protection with the assurance of *fast, free-rolling.* General's "cushioning" principle stops shock concentrations—distributes impact evenly throughout the carcass. All inner construction is extra heavy duty with dual and triple beads, heat resisting rayon cord and General's exclusive ply-bonding.

General Off-the-Road Tires give you General's own Top-Quality built to a heavy duty standard that assures cost-saving extra service on the toughest jobs.

THE GENERAL TIRE & RUBBER COMPANY
AKRON, OHIO

GENERAL *OFF-THE-ROAD* TIRES

IF IT'S A CUTTER CHAIN PROBLEM WE CAN HELP YOU...

No, we're not magicians but we have worked closely with hundreds of mine operators over a period of twenty-five years. Such close relationship has brought us in touch with many difficult problems. Our knowledge and help is yours for the asking.

CINCINNATI
DUPLEX CHAIN

Specialists in Coal Cutting Equipment for 25 Years

CINCINNATI STANDARD CHAIN

Cincinnati Standard Chain accommodates Stanex Holder and Bit or regular ½" x 1" bit. Similar in design to the famous Duplex Chain.

STANEX HOLDER AND BIT

The Stanex Holder and factory made double ended Stanex Bit fits all chains that accommodate the regular ½" x 1" bit.

YEARS ago we started out with one thought in mind . . . to build a better Cutter Chain. For twenty-five years we have devoted all our energies and engineering abilities to that one task. Today, Cincinnati Chains and reversible, double-ended Duplex Bits are acknowledged all over the world for their outstanding performance under any and all cutting conditions. Heat-treated and drop-forged, the Cincinnati Chain is engineered to give greater production at a lower cost . . . to hold shutdowns to a minimum . . . to produce larger cuttings . . . to use less power. Let one of our representatives prove to you the advantages of Cincinnati Time Tested Coal Cutting Equipment. There's no obligation.

THE CINCINNATI MINE MACHINERY CO.

2983 SPRING GROVE AVENUE • CINCINNATI, OHIO

News Round-Up

New Drive to Unionize Mine Supervisors Marked by Lewis Strike Threat

Secretary of Labor Schwellenbach made little progress toward settling the mine tieup at his meeting, Oct. 6, with operators and union representatives. John L. Lewis refused to order the men back to work, asserting he had not called them out. The operators still declined to negotiate the issue of representation for supervisory employees until the men returned to the mines.

Little change was brought about in the sessions held Oct. 8-11, though Secretary Schwellenbach said enough progress was made that both sides asked that a meeting be held each succeeding day. As we were about to go to press, Oct. 11, the strike had spread to 879 mines, with nearly 190,000 miners idle. Decline in coal production had increased to 1,044,403 tons a day on Oct. 11, or close to half the normal daily tonnage.

Acting Administrator Fortas of SFA issued distribution controls Oct. 2 forbidding producers in western Pennsylvania, West Virginia, eastern Kentucky and northeast Tennessee to ship coal except to railroads, public utility plants, hospitals and similar essential users. Ohio and the southern West Virginia-Virginia smokeless fields were added to the list the next day, and central Pennsylvania and western Maryland, Oct. 4. Limitations were extended Oct. 5 to Tidewater and Lake docks operators, who were prohibited from shipping coal for space heating in homes.

IN A WEEK of spreading strikes, John L. Lewis took a direct hand in attempts at unionizing mine supervisors by calling on the operators to meet him in Washington Oct. 1 to enter into an agreement recognizing the United Mine Workers as the bargaining agent for supervisory, clerical and technical employees. The meeting call was accompanied by threat of a strike by the entire membership of the union. In the week preceding Oct. 1, the United Clerical, Technical and Supervisory Employees' Union, Division of District 50, United Mine Workers of America, had succeeded in shutting down 102 mines in western Pennsylvania and northern West Virginia, the stoppages involving 45,000 men.

The call for the Oct. 1 meeting also was preceded by three conferences between Lewis and the operators in Washington during the week ended Sept. 29. In taking a direct part in unionization attempts, Lewis abandoned his former stand that the supervisors' union was independent and was running its own affairs. He also registered himself, at least by inference, as ready to abandon the exemption clause in past agreements reading as follows:

"The term mine worker as used in this agreement shall not include mine foremen, assistant mine foremen, firebosses or bosses in charge of any class of labor inside or outside the mine, or coal inspectors or weighbosses, watchmen, clerks or members of the executive, supervisory, technical and sales staffs of the operators."

The meeting between Lewis and an operators' committee composed of Ezra Van Horn, chairman of the National Bituminous Coal Operators' Negotiating Committee; Edward R. Burke, president, Southern Coal Producers' Association, Charles O'Neill, northern Appalachian operators; and Thomas Moses, president, H. C. Frick Coke Co., having failed to produce an agreement, Lewis sent the following telegram to Mr. Van Horn on Sept. 28:

"Through you I address myself to the coal operators of the bituminous industry. I beg to call your attention to the present disturbed, chaotic conditions existent in wide areas of the industry. This disturbance has no relation to wages, hours or working conditions.

"It is a major convulsion which stems from the refusal of you and your associates to permit the right of union membership and collective bargaining to be granted to the 50,000 foremen, supervisors and technicians of the various classifications in the mining industry. For four years you have refused every suggestion of these men to grant them the right of organization notwithstanding that Congress, through a special statute, has granted them that privilege.

"This office has repeatedly warned you that your policy of suppression and harassment, and oftimes persecution, of the men would inevitably result in the present turbulence in the industry. Within the past week, representatives of the mine workers have urged a change of policy on the part of you and your associates but our suggestions have been repulsed. As a result, the joint national agreement covering this industry is impaired and non-functional in many areas. It is an integrated instrument and the United Mine Workers of America cannot permit it to be further jeopardized.

"I have therefore this request to make, namely, that the national joint negotiating committee of operators and mine workers' representatives assemble in Washington at 2:30 o'clock Monday afternoon, Oct. 1, for the purpose of settling the question involved and abating the controversy that now runs riot and imperils the coming winter's supply of coal.

"Failure on the part of you and your associates to accept this invitation will leave the United Mine Workers of America free to take any such independent action as may be required."

In a reply on the same day, joined in by Mr. Burke, Mr. Van Horn declared that the operators would confer only if the miners were ordered back to work. He added:

"We are glad that your implied threat to call the miners of the country out on strike directly ends the fiction of the United Clerical, Technical and Supervisory Employees' Union of the Mining Industry, Division of District 50, United Mine Workers of America, becoming an independent and autonomous union and exposes it as an integral part of your organization.

"For four years you have tried to compel the managerial forces of the operators to join your union and give their allegiance to you instead of to the companies that employ them. You have been and are now engaged in an attempt to rob the employers of every vestige of control of the operations of properties. You have been up to this time engaged in this attempt covertly and now openly under the name of the pseudo union fostered, financed and directed by you.

"These facts have been known to the operators' committee for four years and each time we have met we have resisted and repulsed your unreasonable demands on this point and have succeeded in having you sign an agreement continuing the clause in the agreement exempting and excluding the management forces from membership in your union.

"We call your attention to the violation of your agreement with us. We categorically deny your reckless charge of harassment and persecution of the supervisory employees. We are anxious to help our country and request your assistance to maintain employment and to furnish much needed coal."

As a hearing by the National Labor Relations Board opened Sept. 27 at Pittsburgh to determine bargaining rights for supervisory employees, 15 more bituminous

mines in western Pennsylvania and northern West Virginia were closed by strikes over that issue. The strikes began following a vote Sept. 20 by members of the supervisors' union at four Jones & Laughlin Steel Corp. mines in favor of a strike, 133 to 41.

Walkouts started the next day, when about 2,900 workers were idle at Shannopin No. 2 and Vesta Nos. 4, 5 and 6 mines. With roving pickets from the struck mines becoming active, sympathy strikes spread steadily to other operations. The disaffection spread to northern West Virginia Sept. 25, when 22 mines in the Morgantown and Wheeling areas closed following a vote the night before at Morgantown.

The NLRB hearing will have to grapple with the old question of whether supervisory employees attain bargaining rights by union representation, and both the operators and the union are awaiting the outcome with keen interest. Opening its case before the trial examiner, Frank M. Kleiler, regional director of NLRB, management reiterated its contention that the supervisory employees were a part of management. Counsel for the Jones & Laughlin Steel Corp., John J. Bane Jr., said: "Congress never intended by the National Labor Relations Act to unionize management."

•

Lewis Urges Increase In Anthracite Output

Increased production of anthracite has been urged from miners in the Pennsylvania hard-coal fields by John L. Lewis, president of the United Mine Workers, to "meet post-war competition of oil and other fuels," according to a report Sept. 25 by Anthracite Industries, Inc. Commending the action of Mr. Lewis and five other union officials, Frank W. Earnest Jr., president of Anthracite Industries, Inc., said the situation in the anthracite industry calls for aggressive action at this time. He added that steps taken by both groups recently affords assurances to dealers and consumers of an increasing supply of anthracite this autumn and winter.

In a letter to the U.M.W. membership Mr. Lewis said: "During the war the anthracite markets were enlarged, bringing in hundreds of thousands of new consumers. Many of these consumers had previously used oil, coke and other substitutes. Since the war ended the coal industry has been kept under government control and supervision while the oil industry has been freed of federal controls. This action gives a competitive advantage to the oil industry and the oil interests have started their campaign for a return of coal users to oil. Prices of fuel oil have already been reduced.

"Increased production per day is largely the answer to the problem of continuity of employment and the maintenance of wage and condition standards. We must cooperate and work to the end that the present market for anthracite coal can be maintained and enlarged if possible. Increased daily production is necessary to bring about and hold this result."

British Mines to Be Nationalized Before Autumn of Next Year

LONDON, Sept. 28 (by cable to *Coal Age*) —Emanuel Shinwell, Minister of Fuel and Power, said this week that the bill nationalizing the coal mines of Great Britain will be introduced before Christmas and that a National Coal Board will be established by Easter and will be composed of experts, not civil servants. The coal mines, the Minister declared, will be operating under national ownership by next autumn.

The Ministry is facing a very critical production problem. At the same time planning is going forward for nationalization output is lagging 120,000 tons weekly behind 1944, when 180,000,000 long tons was mined. Nearly 5,000,000 tons was lost during V-J Day celebrations and other holidays. Stocks are low, especially at gasworks.

The labor shortage is the key to the problem. The present force totals only 702,000. Last year more than 714,000 miners were working. The Ministry is getting priority releases from the services but the move is expected to meet with opposition from former miners. Lawther, president, and Horner, national production officer of the National Union of Mineworkers, are desperately trying to cut absenteeism. Some 500,000 leaflets have been distributed to miners saying that the fate of the Labor Government depends on them. The Ministry's threat to prosecute absenteeism has been removed by Shinwell, but the union still threatens to drop absentees. No official figures are available yet but the Conservative press says that no improvement in absenteeism figures is visible. The mining association has promised its cooperation and the miners have been reassured that the owners will provide interim technical improvements on the basis of a promise by Shinwell that such expenditures from Aug. 1 will be fully reimbursed.

Mining Cost Has Doubled

The coal industry is facing the postwar period with costs doubled and productivity 10 percent below prewar. The cost of mining coal in 1945 is 36 shillings per ton compared with 17 shillings in 1938. Wages have doubled and wage costs are up from 11 shillings per ton to at least 25. The government intends to maintain the present wage rate while lowering the cost to the consumer by modernization. The total capital outlay necessary to carry out such a scheme is estimated at £150,000,000 to £300,000,000.

Chief organizational weaknesses in the industry were stated in the Reid report to be widely scattered buildings, complicated leaseholds and small size of most undertakings. These are believed soluble by nationalization and regional integration. Government ownership, it also is said, would solve the problem of lack of capital and failure to train new entrants.

The Ministry also plans to increase mechanization at the coal face, partly by American methods instituted underground, including manriding facilities and the use of locomotive haulage on straight, level haulage roads. The latter are economically possible only with large units planned under a broad program. Over-all modernization will require 10 to 15 years, and for the present must not interfere with urgent current needs. Improvements are being planned for new pits first, but gradually will be extended to the old mines also.

The essence of the government plan is legislation transferring ownership of all coal-mining undertakings to a National Coal Board—a non-profit-making corporation probably consisting of eleven full-time members appointed by the Minister. There will be a chairman and department heads covering production and development, mining supplies, miners' welfare, distribution, finance, exports, research, etc.; also regional management boards.

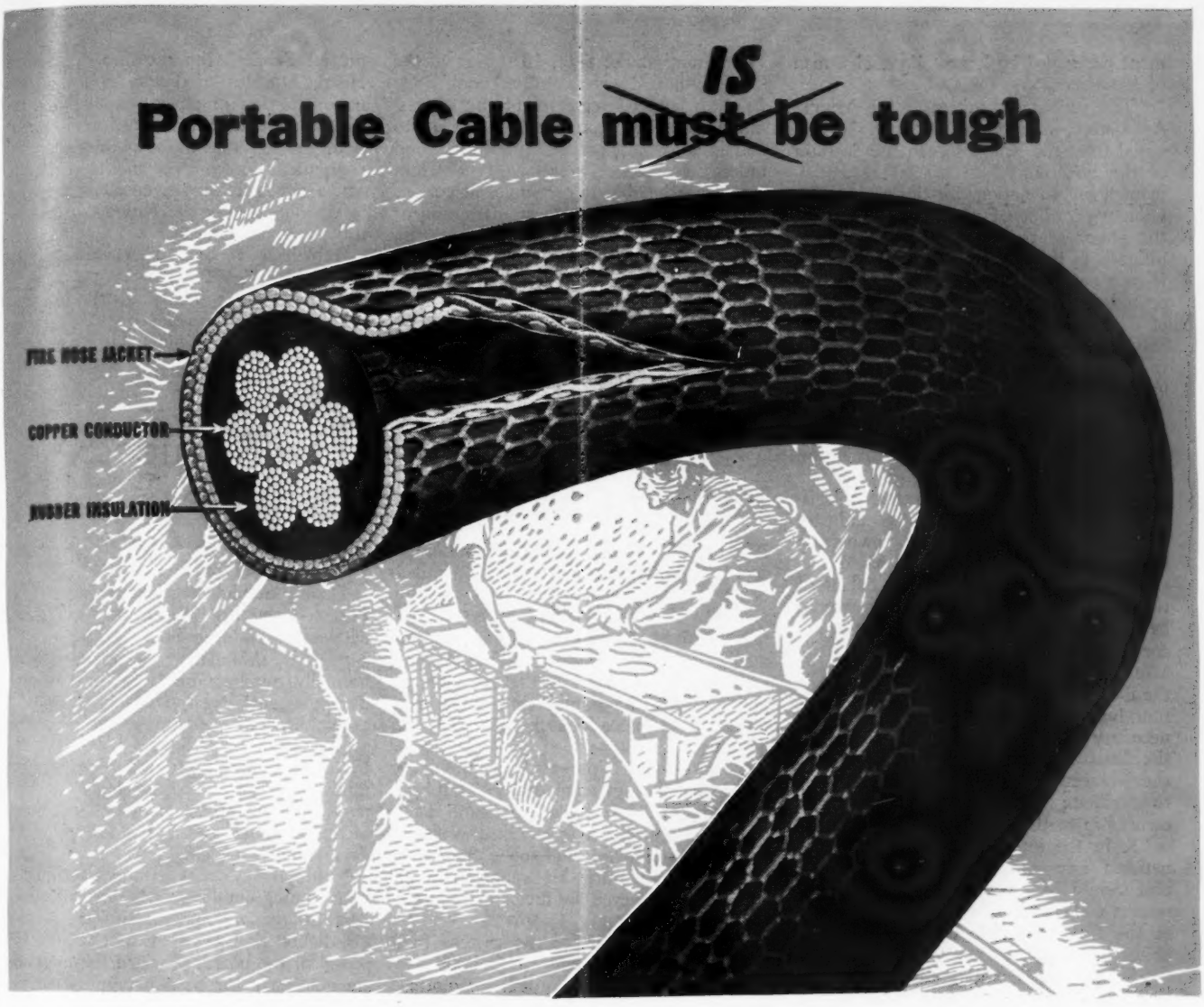
There also will be a Coal Council and regional joint councils to represent the National Coal Board, N.U.M. and consumers. The National Board is to be free of governmental supervision on day-to-day operations but is to be required to follow general directions from the Minister on public policy. Two of the chief contenders for top position on the Coal Board are Charles Reid and Sir Hubert Houldsworth, recently resigned Controller General of the Ministry of Fuel and Power. The latter is younger, has an excellent record and is more acceptable to the miners.

Compensation for colliery owners is unlikely to be reached by evaluating capital assets or by taking into consideration the stock exchange value of shares. Instead it is likely to follow the method used in the Coal Act of 1938 (nationalizing royalties), namely, ascertainment of annual value of earnings and applying a given number of years for purchase—in case of royalties, up to 15 years. The question is whether the peace or war period will be used, but yearly figure is unlikely to be higher than £12,000,000, or slightly less than average earnings in 1941 to 1943, thus making the total cost of compensation under £200,000,000. Compensation probably will be paid in cash raised by special State loan.

The laborites are against creation of Coal Board equity capital such as the "C" class shares of the London Passenger Transport Board. They wish to avoid the creation of any class of stockholders and make the State the sole stockholder in this industry.

British coal-mine owners on Aug. 30 pledged full cooperation to the Labor Government in working out details of the program for nationalization of the industry. Though reiterating their conviction that private ownership would serve the national interest best, they offered their assistance through their national organization, the Mining Association. The following state-

Portable Cable ~~must be~~ IS tough



WHEN IT'S FIRE-HOSE-JACKETED

Duracord

DURACORD saves rubber and yet it's one of the toughest of all mining cables. For 25 years it has proven itself under the most adverse conditions.

The fire-hose jacket is the answer. It's woven—not braided. That's the secret of its extra strength and toughness. The covering is embedded in the belt to boost tensile strength.

You'll be surprised at the flexibility of Duracord—how easily it handles. All the way through, Duracord is *engineered* by mine cable specialists with long experience.

Just examine the rugged construction and you'll see why Duracord survives the toughest mine operations.

Ask for detailed information at any of our sales offices. 4R2946

ANACONDA WIRE & CABLE COMPANY
Subsidiary of Anaconda Copper Mining Company
General Offices: 25 Broadway, New York City 4
Chicago Office: 20 North Wacker Drive 6
Sales Offices in Principal Cities

ANACONDA Anaconda Wire & Cable Co.

ment was issued by Robert Foot, chairman of the association:

"The central committee of the Mining Association, having met on Aug. 16 and noted from the King's speech the decision of the government to lay before Parliament a bill to nationalize the coal-mining industry, considered what should now be the policy of the association in the best interests of the nation and of the industry. It was agreed that the members of the central committee should report the results of this discussion to meetings of the colliery owners in the districts and, following these, the Mining Association today unanimously passed the following resolution:

"1. The colliery owners believe that private enterprise is the right basis for the efficient conduct of the coal-mining industry in the national interest.

"2. But, in view of the fact that legislation for the transfer of the industry from private enterprise to public ownership is to be proceeded with, and having regard to the statement made on behalf of the government that the industry would be fairly treated so far as compensation is concerned, the colliery owners, through the Mining Association, place themselves at the disposal of the government, in connection both with the working out of the necessary organizations to be created on the basis of public ownership and with the arrangements which will be necessary to facilitate the transfer from private ownership to the new organization.

"3. In the interim period it is of vital national importance that the output of coal should be increased, and the colliery owners will cooperate with the government in the fullest possible manner with this object in view."

The miners, according to reports, also have promised Mr. Shinwell [Minister of Fuel and Power] that they will tackle energetically the problem of increasing production. Target figures are to be set for each district and the men at every pit will get day-to-day reports when production is falling.

The report of a special subcommittee appointed by the National Union of Mineworkers to study Mr. Shinwell's proposals states that appeals will be made to union men by leaflet, meeting and poster. Miners' M. P.s will be asked to cooperate. The campaign was to start Sept. 15.

The subcommittee will meet the Minister to put forward the question of better equipment. Possible improvements in food rationing to prevent wastage of manpower also will be discussed.

The colliery companies will be asked to provide alternative work instead of paying guaranteed wage shifts. The subcommittee also is to seek facilities for the training of new face workers, for the provision of temporary bathing arrangements where pithead baths are not available and for the introduction of the best possible facilities for training juveniles. They will ask for the release of miners from the Forces.

Addressing the National Association of Colliery Managers at a meeting held in London in late September, Shinwell said the government's goal of an extra 8,000,000 tons of coal in the coming winter must be reached.

Presiding at the Sept. 10 session of the Trade Union Congress at Blackpool, Ebby Edwards, general secretary of the miners' union, said that manpower was the key to Britain's reconstruction problems, and unless the problems were solved the nation would not be able to get sufficient coal.

Referring to proposed nationalization of the industry, Mr. Edwards said that the opportunity of making the move a success was a trusteeship that the unions could not afford to underestimate. The project, he added, must stand the tests of industrial efficiency and national welfare.

The Renner Cabinet, in Austria, approved Sept. 7 the measure of Edward Heinl, Minister of Trade, proposing the nationalization of power, mining and petroleum production, iron and steel fabrication, the manufacture of heavy electrical equipment, locomotives and railroad cars. Mr. Heinl said the government intended to develop greatly the nation's hydroelectric power system, but was hindered, he said by lack of capital. A yearly output of 25,000,000,000 kilowatt-hours would be attainable, he said. This would make Austria almost independent of foreign fuel, the supply of which now represents about 10 percent of her total imports.

Distribution Restrictions Reduced; Feared Coal Deficit Dwindles

RESTRICTIONS on retail deliveries of coal to household consumers were rescinded Sept. 12 by Secretary Ickes, removing the necessity of having to limit domestic consumers to 80 percent of normal requirements for anthracite and scarce eastern bituminous coal. He said the over-all supply of all fuel for home heating was now sufficient to meet consumers' needs in general.

Controls over shipments from producers and wholesalers to retail dealers would be retained, Mr. Ickes said, to assure each community an equitable share of available coal, coke and other solid fuels. Shortages of the most popular kinds and sizes of coal will be relieved by increased supplies of other fuels.

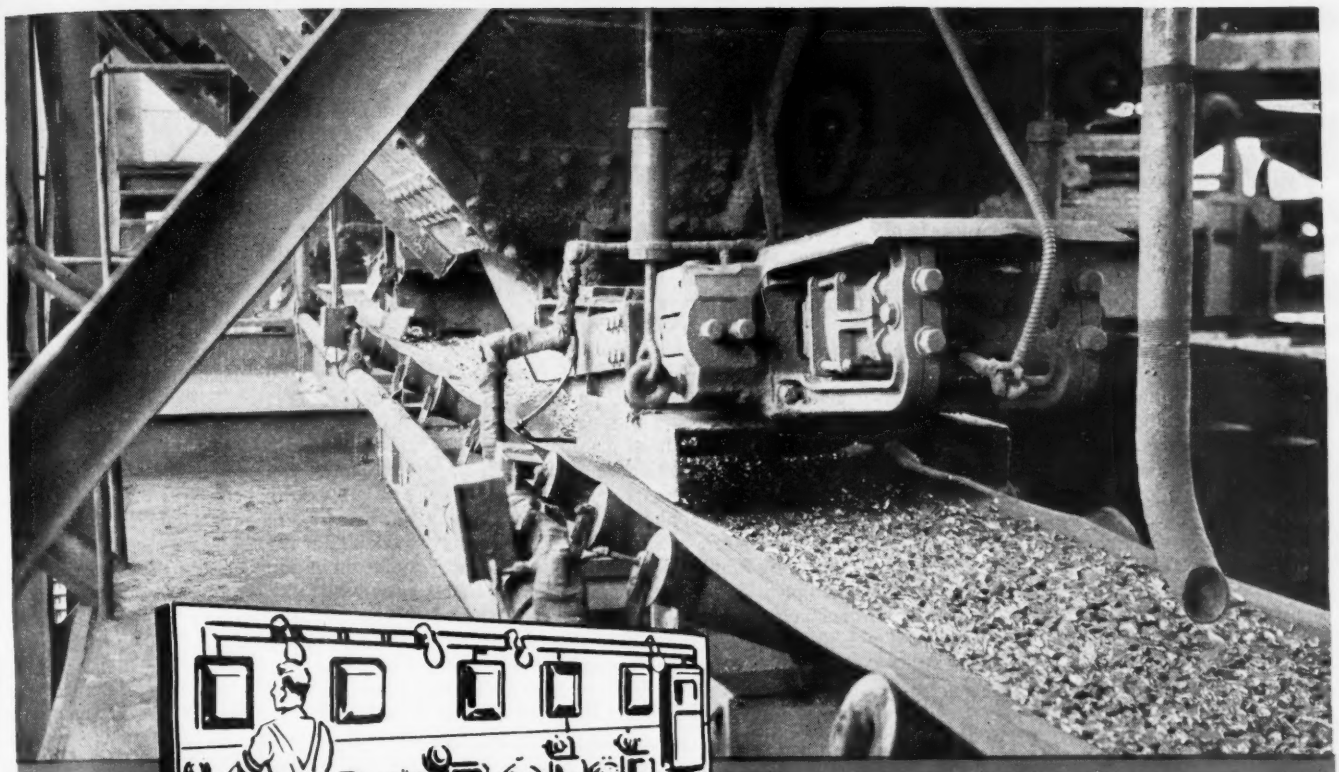
Placing the needs for the current fuel year at 570,000,000,000 to 585,000,000 tons, depending on how much is exported and whether householders receive all they want, Mr. Ickes predicted Aug. 31 there would be a close finish between the country's needs and production.

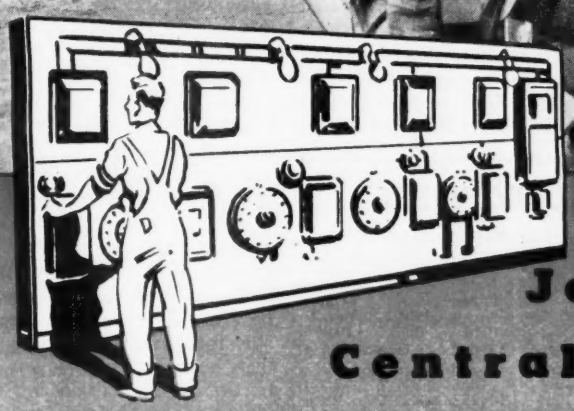
Deputy Solid Fuels Administrator C. J. Potter vigorously urged producers and wholesalers of bituminous coal Sept. 4 to accelerate shipments to retailers who normally purchase only one or two cars during an entire year.

Suppliers of coal to federal agencies other than the War and Navy departments, Maritime Commission and Veterans Administration have been directed by SFAW not to divert shipments of coal from any of such agencies if it has less than 30 days' supply on hand.

Voluntary increases in wages of bituminous mining employees who are not members of the union but subject to the jurisdiction of NWLB do not require approval of the board, provided the increases are not made the basis of application for price relief beyond that already granted, according to a letter made public Aug. 30.

"Manpower shortage!"





Jeffrey-Traylor
Centrally-Controlled
PROPORTIONING FEEDERS
(Patented)

This battery of No. 4 Jeffrey-Traylor Electric Vibrating Feeders proportions four grades of coal to the belt conveyor.

Complete control for these feeders is located at a central point so that the mix can be varied instantly to meet changing needs.

THE JEFFREY MANUFACTURING COMPANY

ESTABLISHED 1877

Baltimore 1 Buffalo 2 Cleveland 13 Harlan Milwaukee 11 Pittsburgh 22
Birmingham 3 Chicago 1 Denver 2 Houston 5 New York 7 St. Louis 3
Boston 16 Cincinnati 2 Detroit 13 Huntington 19 Philadelphia 3 Salt Lake City 1
Scranton 3

Selective Service headquarters instructed all local boards Aug. 31 that deferment of men for work in coal mines be given special consideration.

Firewood and coal rationing in the Pacific Northwest ended Aug. 31, by order of OPA.

In a "Notice of Direction to Shippers of Coal Produced in District 2, 7 or 8 Moving via the Great Lakes," dated Sept. 14, SFA stipulates that: Notwithstanding any provision of Regulation No. 27, shippers of coal produced in those districts shall immediately rearrange their distribution schedules for the period Sept. 17 to Nov. 17 so that commitments for coal moving via the Lakes to a dock or other unloading facility (excepting all points on Lake Erie, Lake Ontario, the Welland Canal and the St. Lawrence River and all points on Lake Michigan within the States of Illinois and Indiana) are met in full.

The direction recites that "such commitments include contracts entered into in accordance with Regulation 25 and contracts for coal moving via the Lakes in accordance with Regulation 24, as modified by any SFAW directions, approvals or adjustments." Shippers are directed "in so far as practicable" to arrange distribution schedules so that not less than one-half of the coal necessary to fill such commitments will be shipped before Oct. 17. This directive is not to affect the order of Aug. 30 directing a cut of 5 percent in lake shipments.

SFAW Regulation No. 31 was amended Sept. 5 so that no agency or person shall export overseas any solid fuel without SFAW approval. This agency announced Sept. 20, however, that all foreign countries other than liberated areas would have to "shop in the open market" hereafter for American coal. Under export procedures defined by Abe Fortas, Acting Administrator, SFAW will notify the Foreign Economic Administration of the quantity of fuel available for export and FEA will establish quotas for the respective countries. Those outside the liberated areas will be required to apply directly to American suppliers for their coal and pay the export price premiums.

By notice of direction issued Sept. 14, SFAW specifies that an industrial consumer of coal whose days' supply exceeds 60 days is prohibited from receiving during the month of October, 1945, coal produced in District 11 (Indiana) in quantity greater than 100 percent of his consumption requirements for such month; and with respect to coal produced in District 10 (Illinois) an industrial consumer may not receive more than 100 percent of his consumption requirements for October if his days' supply exceeds 30 days.

The directive further provides that: "An industrial consumer receiving coal from districts 10 and 11 is prohibited from receiving more coal in the aggregate during the month of October, 1945, than he is permitted to receive from District 11 and he is further prohibited from receiving from District 10 more coal than he would be permitted to receive if he purchased coal only from that district."

This directive, in so far as it applies to shipments from districts 10 and 11, is a continuation of the directive issued Aug. 13 applicable to the month of September, but it is to be noted that the present directive omits any limitation on industrial shipments from District 9.

Anthracite producers may apply for permission to make a service charge for loading coal into trucks from bins or pockets at the mine or preparation plant, or for any other special service, OPA reported Sept. 7. Wherever such permission is granted, however, OPA says that these charges—not to exceed 50c. per ton on all sizes down to rice, and 25c. a ton on smaller sizes—cannot be passed on to the public except in rare instances where consumers buy direct from a mine.

Increased production coupled with reduced war requirements will enable dealers to supply householders with more anthracite this winter, according to a statement Sept. 9 by Frank W. Earnest Jr., president, Anthracite Industries, Inc. Predicting that anthracite output this year will be at least 4,000,000 tons greater than that of the last peace-time year, Mr. Earnest added that the European fuel shortage would have only a slight and indirect effect upon the anthracite situation at home, since the type of coal being shipped overseas is not the type used in home heating in this country.

With a reduction of 1½c. a gallon in the retail ceiling price of domestic fuel oil becoming effective in 17 eastern States and the District of Columbia Sept. 1, just two weeks after the Petroleum Administration for War began self-liquidation, coal-burning householders in that area began turning to oil heat for the coming winter in numbers limited only by supplies of equipment, according to a front-page story in the New York *Times*.

Lured by the almost limitless pool of fuel oil made available by the war's end, said the *Times*, some home owners became so eager to assure themselves of oil heat that black marketing broke out in the sale and installation of equipment. Some householders, in fact, with part of their coal supply already laid in, contracted for oil-heat installations when oil was freed from rationing and offered coal companies $5 a ton to take anthracite out of their bins and deliver it to non-converting customers.

A spokesman for PAW said there was enough domestic fuel oil available to permit every householder to keep his thermostat as high as he wants it all winter and to take care of all conversions from coal-burning equipment too. Walter J. Dockerill, area distribution manager for SFA, said a large shift from coal to oil heat might make a little more coal available for homes that did not convert, but that the major factors in any decision would be over-all production and export requirements.

COAL ACTIVITY

Bituminous Coal Stocks

	Thousands Net Tons Aug. 1 1945	—P.c. Change— From July 1 1945	From Aug. 1 1944
Electric power utilities	14,282	+ 4.0	−15.8
Byproduct coke ovens	4,753	− 7.3	−17.1
Steel and rolling mills	656	− 6.7	−18.6
Railroads (Class I)	10,222	+ 3.5	−25.9
Other industrials*	15,109	+10.2	−17.2
Total	45,022	+ 4.3	−18.9

Bituminous Coal Consumption

	Thousands Net Tons July 1945	—P.c. Change— From June 1945	From July 1944
Electric power utilities	6,062	+1.5	−5.5
Byproduct coke ovens	7,695	+4.8	−3.9
Steel and rolling mills	747	−2.0	−3.4
Railroads (Class I)	10,061	−0.1	−1.9
Other industrials*	9,989	−8.4	+1.4
Total	34,554	−1.4	−2.1

* Includes beehive coke ovens, manufactured-gas plants and cement mills.

Bituminous Production

August, 1945, net tons	47,800,000
P.c. change from August, 1944	−13.7
January-August, 1945, net tons	391,690,000
P.c. change from Jan.-Aug., 1944	−7.3

Anthracite Production

August, 1945, net tons	4,644,000
P.c. change from August, 1944	−16.4
January-August, 1945, net tons	36,236,000
P.c. change from Jan.-Aug., 1944	−16.2

Sales, Domestic Stokers Vs. Oil Burners

	Stokers	Burners
July, 1945	8,432	7,598
P.c. change from July, 1944	+160.2	+320.5
January-July, 1945	46,764	35,829
P.c. change from Jan-July, 1944	+199.7	+173.3

Index of Business Activity*

Week ended Sept. 29	159.0
Month earlier	175.5
Year earlier	230.8

* *Business Week, Oct. 6.*

Electric Power Output†

Week ended Sept 29, kw.-hr.	4,038,542,000
P.c. change from month earlier	−2.4
P.c. change from year earlier	−7.5

† Edison Electric Institute.

New Producers Open; Old Mine Closes

Tennessee Coal, Iron & Railroad Co., subsidiary of the United States Steel Corp., will open a new coal mine in the Concord area of Alabama. It will produce an estimated 4,200 tons daily at its ultimate capacity. Its major features will include a 2,200-ft. hoisting slope, a 1,400-ft. material slope, an 18-ft.-diameter shaft, 9 miles of railroad and the customary surface facilities. Improvements looking toward increased output also will be made at the company's Edgewater and Short Creek mines.

A new battery of 63 modern coke ovens will be installed at the Fairfield coke works. This will be in the nature of replacement, as one of the older batteries is to be removed when the new battery is completed. Work on the project, which will begin immediately, will require about 18 months for completion.

Union Colliery Co., with offices in St. Louis, plans to open a new coal field northwest of DuQuoin and southeast of Pinckneyville, Ill., and close the Kathleen shaft, which has been operating at Dowell, Ill., since 1917. The new mine, a slope operation, will employ about 500 men, or 100 less than Kathleen, and capacity will be about 5,000 tons, the same as at Kathleen. Modern belt equipment will be installed to bring out the coal, and a new

LABOR *and* MANAGEMENT MEET— *for* PEACE *or* CIVIL WAR?

THE prospect of a knock-down and drag-out fight in the automobile industry does not augur well for the reconversion outlook, which upon every other score is bright. Any widespread outbreak of the type of industrial warfare which now threatens will disrupt, more thoroughly than anything else on the horizon, an orderly transition to a peacetime economy.

It is doubly unfortunate that there should be a general tightening of union and company battle lines upon the eve of the Labor-Management Conference, which on November 5th will convene at President Truman's direction for the purpose of "working out by agreement means to minimize labor disputes." If the current work stoppages occasioned by industrial conflicts should increase rather than diminish between now and November first, the Conference atmosphere hardly promises to be favorable to a dispassionate examination of basic issues.

Yet the shadow of the threatened industrial storm that hangs over the Conference only serves to emphasize the importance of reaching satisfactory agreement upon two problems with which such a Conference might deal. The first is that of determining what machinery shall be used for settling disputes upon which employers and workers have reached an impasse. The second, and more far-reaching, is that of arriving at some common understanding upon the major issues which commonly lead to irreconcilable disputes.

Settlement of Wartime Disputes by the War Labor Board

During the war the first problem was handled largely by machinery centered in the National War Labor Board. Supported by general adherence to patriotic pledges by labor leaders and employers not to resort to the use of economic force against each other during wartime, and backed up on rare occasion by use of the President's power to seize plants for war purposes when its orders were not obeyed, the Board managed, by what amounted to compulsory arbitration, to settle the nation's wartime labor disputes with relatively little economic loss.

But it can scarcely be claimed that the War Labor Board did much to resolve the issues from which disputes grow. Indeed, the fact that it was available to issue orders in cases which the Secretary of Labor certified as likely to "lead to substantial interference with the war effort", resulted in the conversion into full fledged disputes of many disagreements which would otherwise have been settled at a local level in the course of collective bargaining. Meanwhile, local collective bargaining machinery which should have been doing most of this work was neglected, and will need thorough reconditioning even to be brought back to its prewar level of effectiveness.

With V-J Day came an abrupt change in the status of the War Labor Board. One of its main props, labor's "no strike pledge", was promptly withdrawn. It could no longer rely on the President to use his power to seize plants for war purposes to force obedience to its orders. Consequently the Board agreed that it would accept new cases only if both parties to the dispute stipulated in advance that they would abide by the Board's findings, that it would clear its dockets of old cases as rapidly as possible, and that it would then go out of business, leaving to the Labor-Management Conference the question of what should take its place in the postwar period.

What Shall Take the War Labor Board's Place?

The immediate and pressing task of the Labor-Management Conference is to agree upon machinery for settling industrial disputes in the peacetime economy.

Neither management nor labor wants the continuation of compulsory arbitration to which they submitted as a necessary war measure. But it must be clear to everyone that if any substantial proportion of the disputes that inevitably arise are settled by resort to strikes and lockouts, economic anarchy will result. Not only will it be impossible to achieve the high levels of output and employment that have been set as postwar goals, but it is questionable whether our economy could survive. The only alternative to compulsory arbitration under government auspices is for management and labor to demonstrate their ability to effect a peaceable resolution of their differences without it.

The most obvious need is to set up local machinery at the grass roots where disputes originate. That is where most of them should be settled by local negotiation and, when that fails, through voluntary submission to mediation or arbitration under terms of reference to which the parties agree. Many issues, which at plant level are relatively simple in character, are blown up to formidable dimension and complexity when they are passed along

the line for decision in Washington. The centralizing process is one that frightens everyone connected with it because it focuses attention upon the possible importance of precedents established by a decision, rather than upon resolving satisfactorily the particular dispute at hand.

Unquestionably, some Federal machinery must be provided which may be called upon in cases where the size or implications of a threatened dispute clearly run beyond local jurisdiction. That will mean the thorough revamping of conciliation and mediation machinery which exists, but which has grown rusty through disuse while compulsory arbitration was the order of the day.

At least, this involves a complete overhauling of the United States Conciliation Service with a noteworthy strengthening of its personnel. There may be wisdom also in recently advanced suggestions for the creation of a board of arbitration to act in cases voluntarily submitted by the parties concerned, and for boards of inquiry to make reports upon the merits of disputes in which the public interest is concerned. But there is valid ground for questioning what appears to be the common assumption that such machinery should be located in the Department of Labor. It belongs neither there nor in the Department of Commerce. For the work which such agencies are called upon to perform, both the appearance and fact of complete impartiality are essential to effective performance. Assurance of impartiality will not be fostered by placing them in a department specifically charged by Congress with the task of advancing the interests of wage workers.

Resolving the Issues Over Which Disputes Arise

It may be, as many think, that the forthcoming Labor-Management Conference cannot effectively handle any problems beyond the procedural ones suggested above. If that is true, its agenda probably should be restricted to planning the reconstitution of collective-bargaining and dispute-settlement machinery, in view of the urgent need for putting it in working order.

But either in this Conference, or in subsequent ones, there will have to be an attempt to reach a reasonable measure of labor-management accord upon certain basic issues over which most industrial disputes originate. The best of machinery can be swamped if disputes are generated in ever-increasing number.

Most important of such issues is that of the fair determination of wages. There is clear need for reaching agreements at least upon the major factors on which such determination should rest. It seems evident that if we are ever to hope to reach the high levels set and generally accepted as postwar goals, we must harness economic incentives to promote production efficiency. That means that workers, as well as management, must be given a genuine stake in increased productivity. No universal formula is possible, but we should be able to agree upon general principles for dividing returns derived from improved performance in output between workers and investors, and consumers in the form of lowered prices.

Again, since unionism is here to stay, general acceptance by management of the principle of collective bargaining would save innumerable disputes which are concerned more with the method of negotiation than with the concession sought. Few in management still question the validity of the collective bargaining process as such, but there are many matters to be resolved of which the question of the open shop, the union shop, or the closed shop is merely a conspicuous example, upon which there is wide divergence of conviction between and within labor and management groups.

On the management side, there is sincere concern about the intent or ability of union leaders to exercise responsible control that assures compliance with contractural obligations. Wild-cat strikes are of sufficiently frequent occurrence to give substance to this distrust, and union discipline seldom has been administered in a decisive or effective fashion. The prospective rivalry of three competing labor organizations of national scope gives management little confidence that a bargain made and kept in good faith with any one of them provides assurance against work stoppages.

All of these matters, and many others, need thrashing out between management and labor, with the view of arriving at as large a measure of specific and detailed agreement as can be achieved. The greater the area of such agreement, the smaller will be the area for disputes that must be handled by settlement machinery, or put to the final test of force.

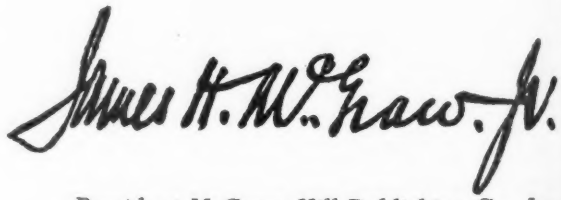
Peace or Civil War in Industry

The Labor-Management Conference is of major importance to national welfare. It is important even if it restricts its objectives to the procedural problem of how industrial disputes are to be handled.

It can make an even larger contribution if it lays the groundwork for an attempt to reach working agreements upon such policy issues as have been cited above.

Neither management nor labor can afford to lend anything less than their best intelligence and effort to an attempt to arrive at common understanding. Success will mean that we have a genuine chance of reaching new levels of economic well-being. Failure will mean industrial civil war, in which the casualties will be high. One almost certain casualty of such a war will be the principle of collective bargaining, since the Government can scarcely refrain from establishing compulsory arbitration if sufficient breakdown occurs.

It is to the vital interest of both management and labor to demonstrate that they can responsibly control themselves.



President McGraw-Hill Publishing Co., Inc.

THIS IS THE 40TH OF A SERIES

OUT OF THIS WAR —the Red Diamond Engine

International Red Diamond Engine. Heavy-duty power for heavy-duty work. Ample power and capacity —surprising economy. Proved in actual combat warfare, now available for civilian service.

The new Red Diamond Engine powers International Models K-8, KS-8, KR-11, and KS-11.

THE rugged requirements of warfare on every battlefront have inspired the engineering genius of American industry.

Out of this war has come, for example, the *new International Red Diamond Engine.*

Tens of thousands of International Military Trucks and Half-Tracks—powered by this new International Red Diamond Engine—have set new transportation and combat records in wartime service.

Many of these mighty Red Diamond Engines have already gone into International Heavy-Duty Trucks for essential civilian use. The men who operate them will vouch for the stamina and economy of adequate power for any job.

When new trucks roll out in volume on America's highways, look to International for even greater economy, even greater dependability. And remember—for ten years before the war *more heavy-duty Internationals were sold than any other make.* Backed then, as now, by the *world's largest company-owned truck service organization.*

INTERNATIONAL HARVESTER COMPANY
180 N. Michigan Ave. Chicago 1, Illinois

NEW TRUCKS: The government has authorized the manufacture of a limited quantity of light, medium and heavy-duty International Trucks for essential civilian hauling.

SERVICE: Many operators will have to wait for trucks. Maintenance of existing vehicles is just as important today as before V-J Day. Therefore—be sure your trucks get top care and service at International Truck Dealers and Branches.

INTERNATIONAL HARVESTER

INTERNATIONAL Trucks

tipple, washer and other facilities will be provided.

The Springfield Coal Corp. has begun work on the opening of a new bituminous mine near Spangler, Pa. An affiliate of Peale, Peacock & Kerr, Inc., New York, the company has two mines at Nanty-Glo, Cambria County, and one at Wilson Run, Clearfield County. Tapping an area of about 17,000 acres of coal land, the new operation will be modern in every respect. A tipple is being constructed and one slope already has been opened up and work started on a second. When it gets in full operation the mine is expected to produce 5,000 tons of coal daily.

Construction has been started by the Katy Coal Company on a new mine at Diablock, Perry County, Ky. M. K. Elben is president and J. L. Rowell, vice president.

Turner Fuel Co., Evarts, Harlan County, Ky., has leased its mine and property to the Baileys-Darby Coal Co., which will make improvements at the mine and expand the property to increase production.

Grading of roads is now under way representing the start of construction by a new corporation, Cawood Coal Co., in building a new mine near Evarts, Harlan County, Ky. The planned capacity is 1,000 tons per day.

Mary Alice Coal Co. has started shipping coal from its new mine on Catrons Creek, Harlan County, Ky.

Earnest Leonard Spangler, Sedalia, Mo., will open a large strip mine in the Midland (Mo.) area, with operations to begin as soon as equipment has been delivered.

Standard Mining & Converter Co. is putting into service the Schoper mine, Macoupin County, Illinois.

Unable to obtain enough workmen, it is reported, the Blacksmith Coal Co. mine, west of Novinger, Mo., has been forced to close and is being offered for sale.

•

Eastern Team Wins Kentucky Safety Test

Eastern Coal Corp. No. 8 team won first place in the first-aid contest at the safety meet of the Pond Creek-Tug River Mining Institute held in conjunction with the U. S. Bureau of Mines, the Kentucky Department of Mines and Minerals and the United Mine Workers Sept. 15 on the Kentucky side of Tug River opposite Williamson, W. Va. The Leckie Collieries Co. team came in second.

•

New Promotion Launched by B.C.I.

Beginning its third year of national advertising, the Bituminous Coal Institute launched its 1945-46 campaign in September issues of general and trade magazines in a continuing effort to inform the general public, the building trade and industrial fuel users of the importance of coal to our modern American civilization, according to an announcement by Harry M. Vauter, institute director.

MEETINGS

• Illinois Mining Institute: 53d annual meeting, Oct. 26, Hotel Abraham Lincoln, Springfield, Ill.

• A.I.M.E. and A.S.M.E.: joint fuels conference, Nov. 1 and 2, Bellevue-Stratford Hotel, Philadelphia, Pa.

• Kentucky Mining Institute: annual meeting, Dec. 7 and 8, Lafayette Hotel, Lexington, Ky.

Foundation stone of the campaign is a series of full-page advertisements—some in color and some in black and white—that will appear monthly in *The Saturday Evening Post, Liberty, Newsweek, Nation's Business* and *United States News*. Illustrations for the series will be done in oils by Rockwell Kent, American artist. A giant figure symbolizing coal dominates all of the illustrations in the series of twelve. Individual advertisements will each relate the dependence on bituminous coal of some basic industry and point out how intimately coal touches the lives of everyone in the country—powering 94 percent of America's locomotives, heating four out of seven of its homes, generating over 62 percent of its electrical energy and how—via chemical processes—more than 200,000 indispensable products, including modern insecticides, sulfa drugs, nylon, anesthetics, and plastics, are made from coal.

Second phase of the campaign is a series of insertions in *American Home, American Builder* and *Architectural Forum*. Illustrations for these advertisements will be models of modern basement rooms, built up on plans which were the prize winners in the recent small homes design contest for architects, sponsored by the institute. Copy will point out the many advantages of coal as a domestic fuel, stressing the fact that the use of bituminous coal for home heating makes possible a basement "living" room that is really a "bonus basement" because of coal's economies.

A special campaign directed specifically at industrial users of coal is planned for later in the year. Benton & Bowles, Inc., handles the account.

EQUIPMENT APPROVALS

Four approvals of permissible equipment were issued by the U. S. Bureau of Mines in August, as follows:

Mine Safety Appliances Co.—Bantam-type rock-duster; 2-hp. motor; 90 or 230 volts, d.c.; Approval 537; Aug. 4.

Goodman Mfg. Co.—Type 2924-EJ slabbing machine; two motors, 20 and 50 hp.; 250 or 500 volts, d.c.; Approvals 537 and 537A; Aug. 24.

Goodman Mfg. Co.—Type 277 power duckbill loader; 3-hp. motor; 250 or 500 volts, d.c.; Approvals 538 and 538A; Aug. 25.

Goodman Mfg. Co.—Type 174-BR shuttle car (battery-operated); three motors, 5 hp.; 90 volts, d.c.; Approval 539; Aug. 24.

•

Gas Pipeline Sold By Chicago Corp.

The interest of the Chicago Corp. in the Tennessee Gas & Transmission Co. has been sold for $10,500,000 to a group headed by Stone & Webster, Inc., it was stated Sept. 10 by Richard Wagner, president of the Chicago Corp. Sale of the company, which operates a 1,265-mile pipeline from Texas to West Virginia, is said to have been made to avoid possible risk to the Chicago Corp. of being classified as a natural gas company by the Federal Power Commission.

Operation of the Tennessee Gas & Transmission line began on Oct. 31, 1944, when 200,000,000 cu.ft. of gas started to flow daily to Pittsburgh, Cleveland and other wartime arsenal cities.

•

Bill Would Probe Mine Labor Needs

Senator Carville (D., Nev.) has introduced S. Res. 171, to authorize the Senate Committee on Mines and Mining to make a "full and complete investigation with respect to reemployment in the mining industry, including existing labor requirements, rates of pay and other related matters," with a view to increasing the number of job opportunities and expanding production. The committee would report to the Senate its recommendations for such legislation as it might deem desirable. It would be authorized to conduct hearings, given subpoena powers and an expense allowance to $10,000. The bill has been referred to the Committee on Mines and Mining.

•

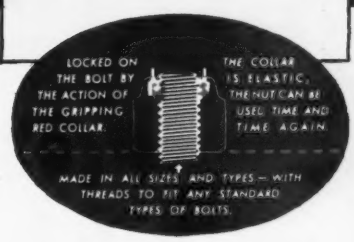
WPB Demobilization Proceeds Steadily

That demobilization of the War Production Board is proceeding apace is shown by recent developments. For instance, the preference rating order, P-56, which came into existence Sept. 17, 1941, and under which the mines operated thereafter, terminated Sept. 30.

L-269, which controls the manufacture of certain types of mining machinery and under which the delivery schedules of manufacturers subject to it are controlled by the Mining Division, is expected to continue until Dec. 31. Hence during the final quarter of this year the delivery schedules of these manufacturers are frozen (subject to any shifts in delivery sequence that the Mining Division may direct and subject also to attempts now being made to step up output). The

A HOLD-DOWN *for Keeps*

Elastic Stop Nuts have been successfully used for hold-down bolts where security is vital. They give a positive fastening wherever there is vibration, impact, shock, stress change. Let us send an application engineer to discuss the Elastic Stop Nut way of avoiding nut failures that may be a costly maintenance item.


LOCKED ON THE BOLT BY THE ACTION OF THE GRIPPING RED COLLAR.
THE COLLAR IS ELASTIC, THE NUT CAN BE USED TIME AND TIME AGAIN.
MADE IN ALL SIZES AND TYPES—WITH THREADS TO FIT ANY STANDARD TYPES OF BOLTS.

This nut uses its head.

An Elastic Stop Nut carries its own insurance for a positive hold-down fastening — the elastic collar built into its head.

Here's how this device works:

The tough but resilient elastic collar forms itself to the individual bolt threads, grips them so tightly that the nut won't loosen up or back off even under the severest vibration.

Forget about cotter pins, lockwashers or any other auxiliaries when you use an Elastic Stop Nut. That means no chance of leaving off these extras as well as saving time in assembly and servicing.

Once on, an Elastic Stop Nut stays on. And it can be used over and over again without losing the grip of its headpiece.

Result: Economy in production and economy in use.

ESNA

TRADE MARK OF

ELASTIC STOP NUT CORPORATION OF AMERICA

Union, New Jersey
and Lincoln, Neb.

Sales Office—1060 Broad St., Newark 2, N.J.

ELASTIC STOP NUTS

Lock fast to make things last

KATHANODE *Guards* BATTERY EFFICIENCY

★

To give your shuttle car more hours of trouble-free performance

Kathanode Positive Plate Assembly

Kathanode's exclusive glassklad construction minimizes loss of power producing active material. This means sustained useful power through more hours of trouble-free performance in your shuttle cars.

Look at the Kathanode unit pictured above. Note how the plate extends below the mats and open-end envelope. Minute, spent particles of active material, filtering down through the mats, fall freely into the sediment chamber. There is no obstruction to cause them to lodge or tree. They cannot create short circuits and other internal cell losses.

Note also how the perforated rubber envelope holds the spun glass mats against the plate. No useful active material can escape. Capacity is maintained.

Write Dept. 1010 for Catalog 300 on Gould Kathanode Glassklad Batteries for Mine Shuttle Car Service.

GOULD

PIONEER OF GLASSKLAD CONSTRUCTION

GOULD STORAGE BATTERY CORPORATION, Depew, N. Y.

Factories: Atlanta • Chicago • Dallas • Depew • Leavenworth • Los Angeles
North Bergen • Rock Island • St. Paul • Salem • Sioux City • Zanesville

Mining Division will remain in existence until the end of the year at least, but with skeleton personnel.

With respect to priority assistance still available for mine operators, Priority Regulation No. 28 provides for a CC rating, which may be issued (in cases of urgency of type and nature specified in the regulation) to civilian applicants on a specified order for materials, operating supplies, repair parts, capital equipment or new construction. The CC rating is secondary to the MM rating available to the military forces.

The AAA rating—top priority—is still in existence.

•

How Steam-Air Jet Abates Engine Smoke

If properly designed and applied with an adequate muffler, the steam-air jet is an effective tool for locomotive crews in satisfactorily abating smoke, according to a paper presented Oct. 2 at the fuels session of the fall section meeting of the American Society of Mechanical Engineers at the Hotel Netherland Plaza, Cincinnati. The authors, R. B. Engdahl, of Battelle Memorial Institute, Columbus, and E. D. Benton, fuel engineer of the Louisville & Nashville R.R., one working in the laboratory and the other in the field, told how they had spent two years in research on this practical solution to the smoke problem, experimenting with 15 railroads and about 350 engines. Bituminous Coal Research, Inc., was the sponsor of this work.

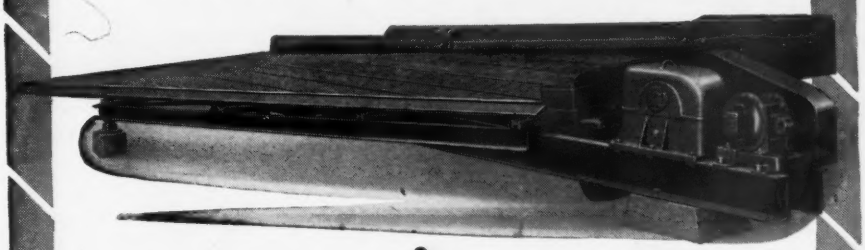
Increasing attention given smoke abatement during the war period and the certainty of increased legislation and enforcement policies after V-J Day prompted research on the steam-air jet. The effectiveness of the steam jet in abating smoke, by its ability to mix air and combustion gases in the furnace, has been known for over 100 years, it was stated. Yet, in spite of its age, little or no data were available from which an efficient installation could be made, resulting in haphazard design and often disappointing results. Because of these investigations in 1943 by Engdahl, the optimum values of some hitherto uncertain design features, together with steam-air entrainment ratios when steam pressure, nozzle and air-tube diameters were varied over a range of practical values, were made known for the first time. Other obstacles to general acceptance of steam-air jets were excessive noise and lack of automatic control. About two years ago, both of the authors undertook to develop for the locomotive a practical muffler and a method of control that would be automatic and also modulate the quantities of overfire air in relationship to the quantity of coal burned.

"In no sense of the word," it was stated, "should it be assumed that the steam-air jet is a complete substitute for a good fireman. Neither working independently of the other is able to do a satisfactory job at all times. When they complement each other they are an unbeatable team, even under adverse conditions."

Irvin D. Groak, president, Groak Engineering Corp., Chicago, spoke at the same session on "Pressure Combustion."

Are You Interested In

HIGHEST CAPACITY
with TOP RECOVERY and
LOWEST OPERATING COST?



Read How You Get Them All With

SuperDuty

DIAGONAL DECK TABLES

Because—

The exclusive *diagonal deck* design of SuperDuty Tables provides a greater actual working area. Due to this and other *SuperDuty* Table features, including the efficient Concenco Anti-Friction Bearing Head Motion, SuperDuty surpasses in recovery any other separating table built and at the same time maintains an equal or higher feed capacity.

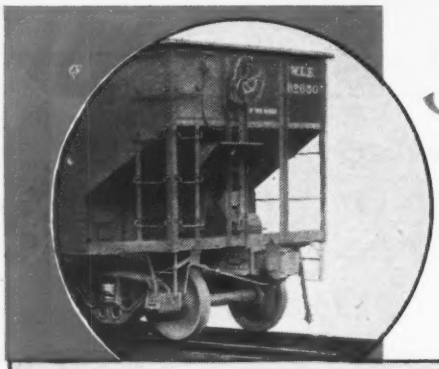
The separating ability of *SuperDuty* Tables is so remarkable that these tables may be used on any cleaning problem where there is a specific gravity difference between relatively free particles of coal and refuse. This is demonstrated by the fact that SuperDuty Tables are successfully used in many installations to clean up the refuse from other processes.

Exceptionally low operating costs and savings on maintenance are guaranteed you by the uniform experience of SuperDuty's many users. SuperDuty Tables operate at substantially 1 H.P. under full load, and sturdy construction keeps repairs negligible for added years of hard service.

Write today for Bulletin 119 and full information on these and many other features of *SuperDuty* Diagonal Deck Coal Washing Tables.

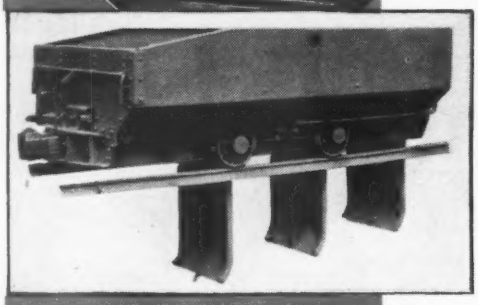
THE DEISTER ★
CONCENTRATOR
COMPANY
909 Glasgow Ave. • Fort Wayne, Ind., U.S.A.
CONCENCO PRODUCTS

★ *The ORIGINAL Deister Company* ★ *Inc. 1906*



Safety in coupling

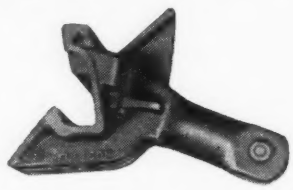
and uncoupling of cars is just as essential in mine operation as on the railroads.

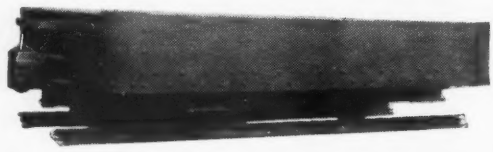


• Willison Automatic Couplers

for mine cars make it unnecessary for men to go between the cars, and also speed up train operation by faster shunting and gathering of cars, smoother operation of train and less spillage of coal.

Specify "Willisons" and save valuable time.

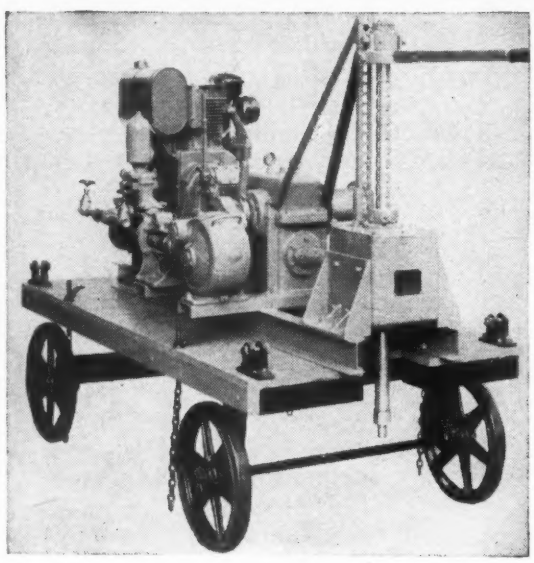




76 YEARS SERVICE
To Transportation

NATIONAL MALLEABLE & STEEL CASTINGS CO.
CLEVELAND · · · · · · OHIO

CORE DRILLING FOR COAL



- Acker Core Drills have been developed over a long period to withstand the hard service required of equipment in all contracting work and in mining operations. It is simple to operate and easily moved. No special skill required. Hand feed pressure instantly permits taking advantage of softer strata to increase progress and lower the cost per foot.
- Variety of tools and equipment for coal and mineral prospecting—proving overburden for strip mining, and all subsurface explorations.
- Combine prospecting and blast hole drilling.
- Mountings to suit individual needs—Trailer—Motor Truck—Skids—etc.

SEND FOR LITERATURE

ACKER DRILL CO.
725 W. LACKAWANNA AVE. SCRANTON 3, PA.

Personal Notes

LEWIS E. LICHFORD, Mayor of Lynchburg, Va., has been elected president of the Meem-Haskins Coal Co., vice Stephen H. Meem, deceased. Mayor Lichford formerly was vice president. Other officers are CARY J. WILKINS, secretary-treasurer; GILBERT MEEM, executive vice president, and M. A. EMMONS, general manager.

G. MOSS PATTERSON, director, State Bureau of Mines and Minerals of Kentucky, has resigned effective Oct. 1 to accept a post with a Charleston (W. Va.) concern. He will be stationed at Lexington, Ky., where he has had his State Mining Bureau headquarters since being appointed in 1940 by former Governor Johnson.

M. K. CLAY, formerly chief electrician, Raleigh Coal & Coke Co., Raleigh, W. Va., has been appointed maintenance superintendent of Harwood mine of the Semet-Solvay Co., Longacre, W. Va. For a number of years he was secretary-treasurer of the New River and Winding Gulf Electrical and Mechanical Institute and continues on the executive committee.

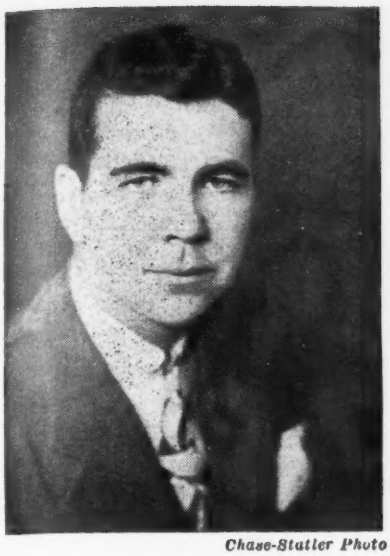
BYRON A. BOYNTON has been named president of the National Fuel Credit Association, succeeding A. KRAUSMAN. Mr. Boynton, who has been vice president of the association for some time, also is general credit manager of the Pittsburgh Coal Co.

JOHN L. AUCH, comptroller, Pittsburgh Coal Co., has beeen elected a director of the Pittsburgh control of the Controllers Institute of America. JOHN D. CLOUSE, controller, Walter Bledsoe & Co., Terre Haute, has been renamed a director of the Indianapolis control. JOHN W. CRAWFORD, secretary-manager, DeBardelaben Coal Corp., has been chosen a director of the Birmingham control.

JAMES HAROLD REPPERT, price executive of the Solid Fuels Price Branch, Office of Price Administration, since August, 1944, has been appointed associate director of the Fuel Price Division, succeeding ORVILLE D. JUDD, resigned. JOHN P. BARNES, division counsel, will be acting price executive of the Solid Fuels Price Branch. Mr. Reppert went to OPA in 1942 from the Reppert Coal Co., Flemington, W. Va., where he was vice president in charge of mines and sales for a number of years. Previously he was assistant chief engineer of the Madeira-Hill Coal Mining Co., Phillipsburg, Pa.

HAROLD B. WICKEY has been appointed chief of the Coal Section, Mining Division, War Production Board, vice John L. G. Weysser, resigned. Mr. Wickey has been connected with the Division since May, 1942, recently serving as deputy chief of the Coal Section.

EDWARD A. LYNCH, Hazleton, Pa., who has been associated with the United Mine Workers of America for the last 15 years, has been named director of personnel for the Philadelphia & Reading Coal & Iron Co. A former newspaperman, he has been assistant since 1930 to the U.M.W. secretary-treasurer, Thomas Kennedy, former



Chase-Statler Photo

Edward A. Lynch

Lieutenant Governor of Pennsylvania. He has participated in every joint conference in both the anthracite and bituminous industries since 1930 and has had wide experience in the field of labor relations.

JOHN J. LINCOLN, Elkhorn, W. Va., chairman of the executive committee, Pocahontas Operators Association, and past president and one-time secretary, received a watch and chain, suitably inscribed, Sept. 5 in recognition of his 43 years' connection with the association. He was a founder and first secretary (1902-18); thereafter a member of the executive committee, treasurer and president (1932-45). The presentation was made by William Beury, vice president; Henry F. Warden, treasurer; W. E. E. Koepler, secretary; H. C. Faust and R. C. Luther.

COL. ROBERT P. KOENIG, president, Ayrshire Collieries Corp., is spending an 80-day terminal leave at his home in Carmel, Ind., having been detached and unassigned from the 1560th SCU Separation Center at Camp Atterbury, Ind., Aug. 31. He expects to spend some time visiting his parents in California, returning to Indianapolis not later than Nov. 21, when he expects to be relieved from active duty and resume his position at the head of Ayrshire Collieries Corp. He completed his military service as chief of the Fuel Section of General Eisenhower's forces in the European theater, having been awarded the Order of the British Empire and the French Croix de Guerre.

CLAUDE S. LAWSON has been promoted from general superintendent to general manager by the Sloss-Sheffield Steel & Iron Co., operating in Jefferson County, Alabama.

FRED OSBORNE has been appointed general superintendent by the Sloss-Sheffield Steel & Iron Co., operating in Jefferson County, Alabama. He formerly was connected with the Woodward Iron Co. in a similar capacity.

STEPHEN WILLIAMS, 67, district deputy mine inspector for 27 years, of Coshocton, has been appointed chief of the State Division of Mines of Ohio, vice Marcus

40% MORE HOLES PER DAY
See the McCARTHY Earth Boring Machine BEFORE YOU BUY
McCARTHY Earth Boring Machine
Salem Tool Co.
HYDRAULIC FEED
FINGERTIP CONTROL
SET TO ANY LEVEL

Introduced less than a year ago, the McCARTHY machine has caused a sensation in the drilling business. Designed by a Strip Mine Driller who knows from experience what operators want in a drilling machine, the McCarthy drills 40% more holes per day. Requires only narrow space yet weighs twice as much (3500 pounds) as other machines. No manual feeding—all hydraulic. Bites through hard and tough substances with ease.

SEE THE McCARTHY BEFORE YOU BUY

In writing, be specific as to what you are drilling, depth, etc., so we can give you factual data. PHONE WIRE WRITE

SALEM TOOL CO. SALEM, OHIO

Drilling and earth boring specialists. Manufacture all types of augurs from 1¼" to 8" dia. and distribute complete line of mining tools and supplies.

HELP DEALERS ---------SPEED UNLOADING

Freezeproof your coal with WYANDOTTE CALCIUM CHLORIDE

The saying, "Haste makes waste," isn't always true. Nowadays, speed in unloading coal is important.

Railway cars must be back on the road again as soon as possible to get another load. And labor and equipment are too scarce to be used in unnecessary work at the unloading track.

Lend your busy dealers a helping hand by freezeproofing your coal with Wyandotte Calcium Chloride. Coal treated with this easy-to-use Wyandotte Product flows freely at any temperature—comes out of the car the same grade as when loaded.

Send the coupon for full information about Wyandotte Calcium Chloride—the safe, sure and economical freeze-proofing agent.

WYANDOTTE CHEMICALS CORPORATION
Michigan Alkali Division
Wyandotte, Michigan

Send me literature and further information about the uses and advantages of Wyandotte Calcium Chloride.

Name _____

Address _____

Title _____

Wyandotte REG. U. S. PAT. OFF. **CALCIUM CHLORIDE**

Wyandotte Chemicals Corporation • Michigan Alkali Division • Wyandotte, Mich.

LUBRIPLATE No. 130-A

LUBRICATION PLUS!

A SUPER LUBRICANT—A MARVELOUS ANTI-SEIZE COMPOUND—A REAL PROTECTION AGAINST RUST AND CORROSION. From the standpoints of general utility and wide diversity of important uses, we do not believe there has ever been a lubricant that compares with LUBRIPLATE No. 130-A. It has everything. The outstanding performance of this super-lubricant and its adoption by industry in general, and the Army and Navy are certainly adequate proof of its superiority. Write for copy of bulletin No. 6-41.

LUBRIPLATE
Lubricants definitely reduce friction and wear to a minimum. They lower power costs and prolong the life of equipment to an infinitely greater degree. LUBRIPLATE arrests progressive wear.

LUBRIPLATE
Lubricants protect machine parts against the destructive action of rust and corrosion. This feature alone puts LUBRIPLATE far out in front of conventional lubricants.

LUBRIPLATE
Lubricants are extremely economical for reason that they possess very long life and "stay-put" properties. A little LUBRIPLATE goes a long way.

Write for a booklet, "The LUBRIPLATE Film" written especially for your industry.

LUBRIPLATE
FISKE BROTHERS REFINING CO.
NEWARK 5, N. J.
TOLEDO 3, OHIO

Kerr, resigned. The term is for six years. George H. Foster, mine inspector, served for ten days as acting chief.

Osborne Morgan, Wilkes-Barre, and Edward D. Gwyn, Taylor, have been appointed junior mine inspectors by the State Department of Labor and Industry of Pennsylvania. The duties include inspection of small mining operations and quarries where the State carries the compensation.

Wilby M. Durham, Salt Lake City newspaperman, has been appointed to handle public relations and edit *Coal Magazine* for the Utah Fuel Co., with operations at Sunnyside, Castle Gate and Clear Creek, Utah, as well as at Somerset and Delcarbon, Colo.

Joe W. Fitzgerald, Fort Smith, Ark., has been reappointed State mine inspector by Governor Ben Laney. Mr. Fitzgerald has held the position since it was created by act of the 1937 legislature.

J. W. Fuller has been promoted from assistant superintendent to superintendent of Poinsettia mine, Block Coal & Coke Corp., Block, Campbell County, Tenn.

B. M. Rogers has been promoted from assistant general superintendent to general superintendent by the DeBardeleben Coal Corp., Sipsey, Ala. He is succeeded as assistant general superintendent by Earl H. Quick, who comes to the company from the Atlas Powder Co., where he was employed in the technical division. He was with the Consolidation Coal Co., Jenkins, Ky., for a number of years.

C. G. Scott, Bluefield, W. Va., has resigned as vice president of the Kingston Pocahontas Coal Co. and general manager of the mines of the Semet-Solvay Co. With the Kingston Pocahontas company since he finished school, he went to Bluefield in 1938, when the two companies opened offices there. Eight years before moving to Bluefield he was located in New York as production manager. Prior to that he was employed by the company in McDowell and Fayette counties, West Virginia, and Pike County, Kentucky.

C. W. Mullins, formerly with the Kentucky State Department of Mines and Minerals, has been appointed superintendent of the Katy Coal Co., Diablock, Perry County, Ky.

R. C. Scott, formerly auditor with Mary Helen Coal Corp., has been appointed general manager, Cornett-Lewis Coal Co., Louellen, Ky.

W. D. Bryant, formerly section foreman, Consolidation Coal Co., Jenkins, Ky., has been appointed district inspector at Hazard for the Kentucky Department of Mines and Minerals.

N. E. Cross has been elected chairman of the Bituminous Coal Producers Advisory Board for District 13 (Birmingham).

•

Holiday Wage Claims In Dispute

Operators' associations of the Kanawha, Logan and Williamson districts in West Virginia have adjudicated the extralateral claims of the United Mine Workers in form closely following that of the Illinois (*Coal Age*, September, 1945), western Pennsylvania, central Pennsylvania and Fairmont operators. A case dealing with the construction of "legal holidays," however, has been referred back to the Joint Group Board by Kanawha, Logan and Williamson.

The U. M. W. Illinois district, as well as the International office in Washington, has taken exception to an interpretation

"COAL" PORK

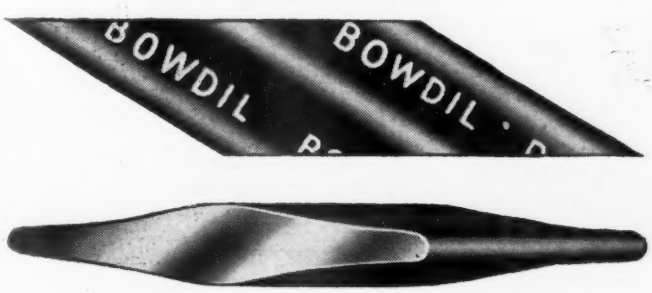
Believe it or not, these pigs eat bituminous coal. They love it. They have been eating coal all their lives, as did their fathers and mothers. Byron Somers, general superintendent, Truax-Traer Coal Co., and farmer shown feeding the pigs bituminous coal, keeps it sprinkled about the pen. He says the pigs like it for its mineral content and that not only his pigs but plenty of other porkers in Illinois like coal, which is bought by the farmers especially to scatter about the pens.

What single fact makes BOWDIL your best choice for coal cutting?

We say it's workmanship! To emphasize that we looked at our equipment from your viewpoint . . . then we listed the facts about BOWDIL equipment in which you would be most interested. Here they are.

First, knowing that one of your problems in using cutter bars is poor chain connections, we decided to point out that BOWDIL Chain sections are positive. They're drop-forged and machined for quick, easy demounting—and the chain won't kink.

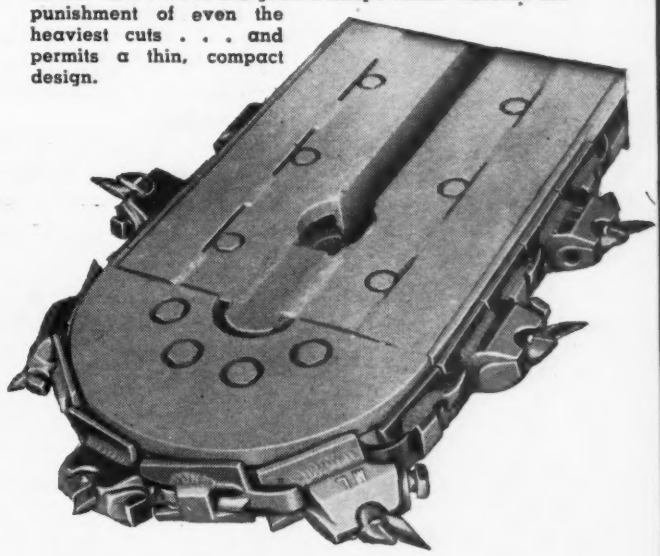
Next is BOWDIL's Cutter Bit, a patented design that features a concave face. This shape permits using the bits 200% to 300% longer than with standard bits.



This shape provides better clearance too, thus it produces coarser cuttings and fewer fines. Power requirements have shown a 15% to 20% drop in actual test runs, using BOWDIL Cutter Bits.

★

Finally, the BOWDIL Cutter Bar. It is designed to eliminate another of your problems—that of strain and stress. A BOWDIL-designed Z shape frame absorbs the punishment of even the heaviest cuts . . . and permits a thin, compact design.



"Headquarters for Coal Cutting Equipment"

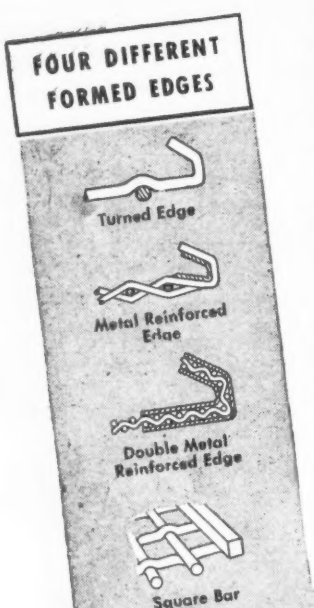
BOWDIL

Canton, Ohio

If you'd like more information we'll be glad to supply it. Address your inquiry to The Bowdil Co., Waynesburg Road, Canton, Ohio

★

In Vibrator or Shaker Screens



FOR EVERY KIND of filtering, sizing, grading or cleaning operation—from fine meshes for filtering blood plasma to coarse meshes of heavy diameter wire for the mining industry—Roebling Screens are designed to retain uniform mesh dimensions throughout long service life.

And you can make your own choice when ordering Roebling Vibrator or Shaker Screens because they are "custom-tailored" to fit your specifications.

The Roebling name is backed by over a century of wiremaking experience. It is your guarantee of quality and dependability in all your screen requirements. Write for complete information.

Woven Wire Fabrics Division
JOHN A. ROEBLING'S SONS COMPANY
TRENTON 2, NEW JERSEY
Branches and Warehouses in Principal Cities

ROEBLING

JAR ROEBLING

PACEMAKER IN WIRE PRODUCTS

WIRE ROPE AND STRAND • FITTINGS • SLINGS • SUSPENSION BRIDGES AND CABLES
COLD ROLLED STRIP • HIGH AND LOW CARBON ACID AND BASIC OPEN HEARTH STEELS
AIRCORD, SWAGED TERMINALS AND ASSEMBLIES • AERIAL WIRE ROPE SYSTEMS • ROUND
AND SHAPED WIRE • ELECTRICAL WIRES AND CABLES • WIRE CLOTH AND NETTING

Aug. 24 by George F. Campbell, president of the Illinois Coal Operators Association, holding that as a result of the Cancellation of Executive Order No. 9420 "an idle holiday will not be counted as a day worked in computing pay for the sixth and seventh consecutive days." John L. Lewis took the position that the reference to Executive Order 9240 in the operator-miner contract "was merely for the specific identification of the holidays in question" and that the treatment of holidays is not affected by the President's revocation of Order 9240.

Mr. Campbell has advised the Illinois operators that this question has been referred to the Joint Group Board. He also has stated that as Labor Day (Sept. 3) was in most cases an idle holiday, the question arises as to whether time and a half or straight time shall be paid for Saturday, Sept. 8, to employees who worked on Tuesday, Wednesday, Thursday and Friday. Operators were advised that the decision must await the ruling of the Joint Group Board.

•

Strip Mining Suits Filed in Pennsylvania

Two lawsuits against Pennsylvania's attempt to regulate strip mining have been filed in the Dauphin County Court, with a third in the offing. State officials have held up enforcement of the 1945 law pending disposition of the litigation.

The Elba Coal Co., Madera, Clearfield County, has joined an earlier attack on the constitutionality of the law brought by Alexander Dufour, also operating in Clearfield County. William M. Rutter, Deputy Attorney General, said he was informed that a third suit would be brought and that when all the cases were in, the opposing counsel would request the Dauphin County Court to hold a combined hearing.

•

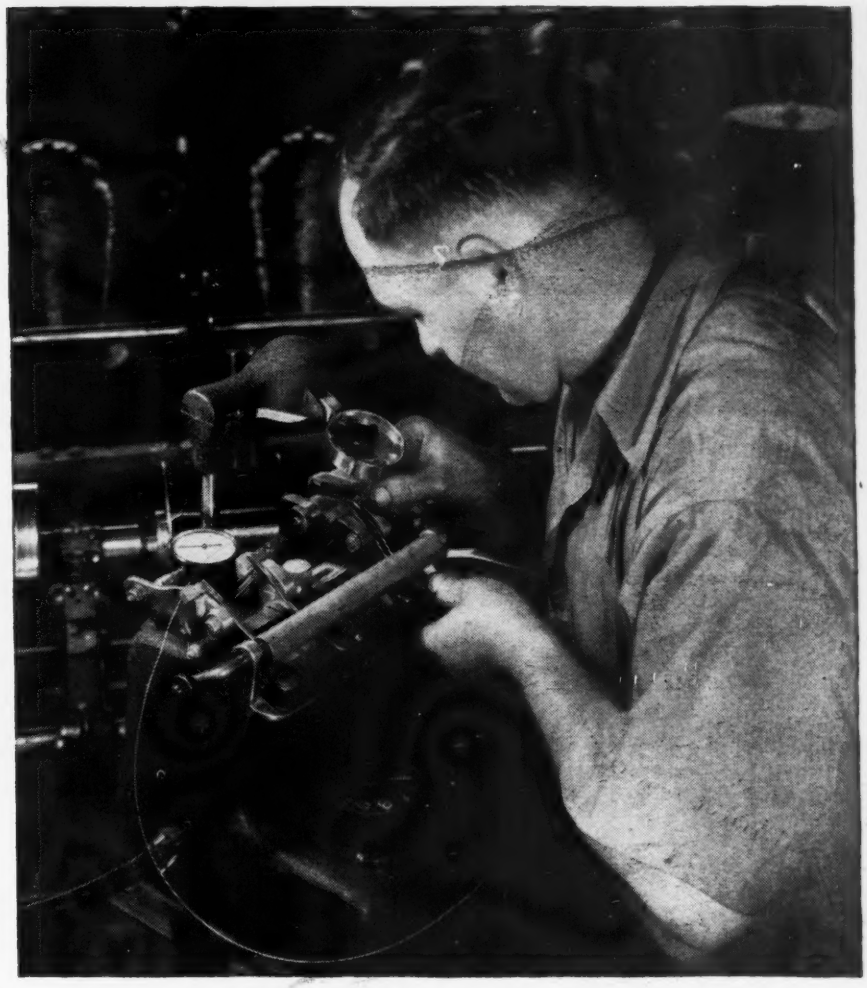
Accident Reduction Management's Job

"Whether we like it or not," said J. E. Rollins, vice president, Bituminous Casualty Corp., Rock Island, Ill., speaking Sept. 15 at a meeting of the Cumberland Valley Mining Institute, Middlesboro, Ky., "the burden of holding down accident cost is the responsibility of management." That serious and costly accidents can be reduced by intensive application of safety practices and that constant safety preaching and practice are necessary to maintain progress is proved, he said, by the fact that individual mines and in some cases whole districts have made progress through campaigns by safety organizations and mine managements for certain periods but have dropped back to old averages when the drives eased up.

Records of the Bituminous Casualty Corp. for 1944 show that of the 1,337 accidents reported in Kentucky 159, or approximately 12 percent, were caused by falls of roof. Of the 30 fatals 16, or 53 percent, were due to falls at the face. Four, or approximately 13 percent, were due to

Established 1871

Welded Wire makes Upson-Walton Wire Rope give BETTER Service



Upson-Walton uses the longest lengths of wire in manufacturing all U-W wire rope.

However all lengths eventually end, and they frequently end in the midst of a job. When that occurs, another length of wire must be joined to the original one—and there are two ways to do that.

The first method is called brazing—whereby the wire ends are overlapped and wrapped with bronze wire; heat is then applied until the bronze melts and a connection is effected. The strength of a brazed wire is less than steel because the bronze used to join it is weaker than steel. This is NOT the way Upson-Walton joins wires!

Whenever it is necessary to join two pieces of wire, Upson-Walton *welds* them. The ends are automatically prepared, the machine is set for the correct wire diameter and it automatically controls the temperature and welding pressure. The wires are *fused* together and annealed to remove brittleness and the resulting single wire is *consistently stronger.* The wire is *more uniform* because the human element has been taken out of it—and *more dependable* because it is uniformly strong.

Specify Upson-Walton for the best in wire rope —U-W LAYRITE for *Pre*formed.

Copyright 1945—The Upson-Walton Company

THE UPSON-WALTON COMPANY

Manufacturers of Wire Rope, Wire Rope Fittings, Tackle Blocks

MAIN OFFICES AND FACTORY: CLEVELAND 13, OHIO

114 Broad Street, New York 4 | 737 W. Van Buren Street, Chicago 7 | 241 Oliver Building, Pittsburgh 22

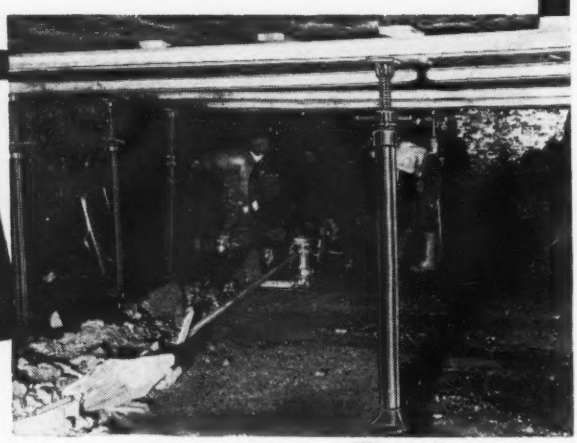
HERE IT IS—

THE NEW, ECONOMICAL

DUFF-NORTON MINE ROOF JACK

TAILORED TO FIT THE JOB!

Cuts your Inventory Requirements



With the new Duff-Norton Mine Roof Jack, you can make your own jacks to the height you need by cutting 2" pipe sections to meet your height requirements and attaching the Duff-Norton base and top fittings. You eliminate the necessity for large stocks of various heights of roof jacks.

- **You buy only the base and screw fittings—cutting your own 2" pipe for height you need.**
- **To change height, simply change the fittings from one pipe to another—easy to attach.**
- **Pipe columns can be used over and over—you save on inventory expense.**

The new Duff-Norton Mine Roof Jacks are available in 2 models: MR-80—8 tons capacity, with a raise of 17", used with standard 2" pipe; MR-160—16 tons capacity, 17" raise, used with double strength 2" pipe. Heads for both models are made in 4 styles to suit all requirements—Ball and Socket, "H" and "I" for H-Beams or "V" for round timbers. Handles are available in 3 styles—slide, drop or wing nut.

WRITE for details now on the cost-cutting, efficient, safe new Duff-Norton Mine Roof Jack.

STRENGTH, SAFETY, DURABILITY
DUFF-NORTON JACKS
ESTABLISHED 1883

THE DUFF-NORTON MANUFACTURING CO.

PITTSBURGH, PENNSYLVANIA

Canadian Plant
COATICOOK, QUE.

•

Representatives
In Principal Cities

haulage. Besides the 16 fatals there were 14 back injuries from falls of roof. Some of those broken backs will prove to be total permanent disabilities. Those percentages of fatal and serious accidents from falls of roof at the face are about the average for the last fifty years.

Mr. Rollins observed that mining institutes are excellent vehicles for safety movements. His company perfected the organization of a mine managers' association in Iowa in 1928 to promote safety. It proved so successful that similar organizations were fostered in other states.

Two hundred men attended the Middlesboro meeting. The institute was recently organized and is just getting under way. Officers are: president, C. B. Burchfield; first vice president, David Ancil Perkins; second vice president, Clarence J. Burton; secretary-treasurer, Thomas Crutchfield; directors, Dick Williams, Lee Rennebaum, Earl Lewis, J. P. Upchurch, Claude R. Matthews; finance committee, Albert B. Hill, Jack Whitfield, Sneed Fox, H. L. Madlock, Earl Griffith; entertainment committee, Earl Ward, Joe Osler and A. A. Fish.

•

Mo. Valley Authority Hearings Under Way

A Senate Irrigation and Reclamation subcommittee opened hearings Sept. 18 on the Murray (D., Mont.) Missouri Valley Authority bill, S. 555. The reclamation features of the measure were opposed by eight governors of the ten States of the Missouri River Valley as well as by numerous reclamation interests in the West. The hearings ended Sept. 29.

Prior to adjournment for the summer recess the Senate Committee on Commerce made an adverse report on the navigation features of the Murray bill, and following consideration by the Irrigation and Reclamation subcommittee a subcommittee of the Committee on Agriculture also will conduct hearings on the measure.

Under the Flood Control Act of 1944, a joint Army Engineers-Reclamation Bureau plan for the Missouri River basin has been rapidly developed by field representatives of the Corps of Engineers, the departments of Agriculture and Interior and the Federal Power Commission. Preparations have reached the stage where construction can begin under the plan as soon as necessary funds are appropriated by Congress.

•

Five Other Towns To Have Mine Schools

Hearty indorsement of the training-for-mine-work program sponsored by the Lehigh Valley Coal Co., Wilkes-Barre, Pa., has been accorded by the U. S. Bureau of Mines, local inspectors of the Pennsylvania Bureau of Mines and local mine union officials. Because of the success of the training program in the short time since its inception at Wilkes-Barre and Pittston (*Coal Age*, September, 1945)

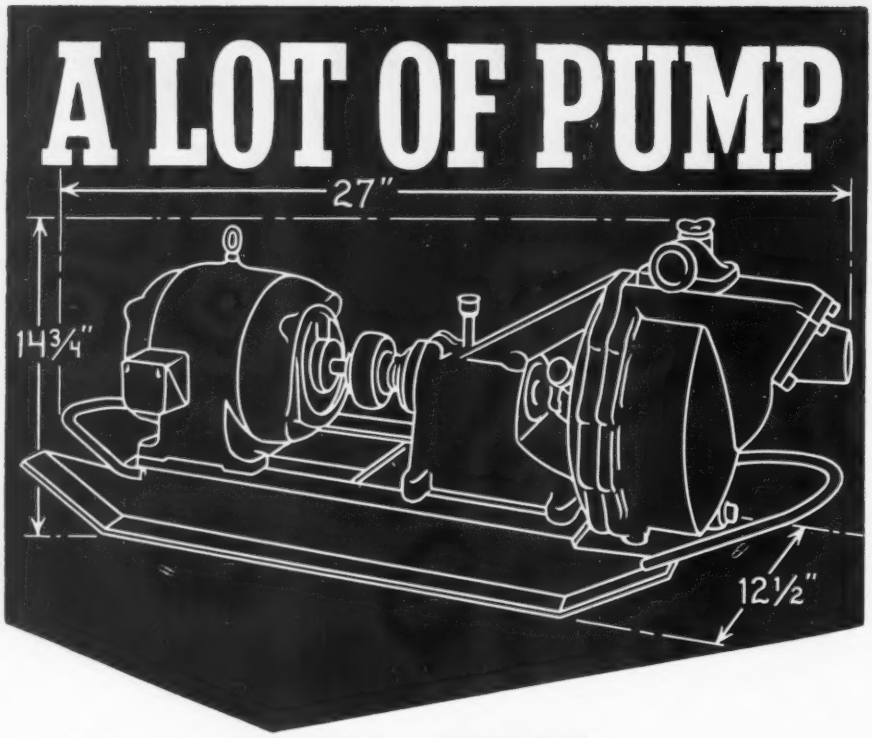
U.S. TIRES
U. S. ROYAL CON-TRAK-TOR
(lug type) (rib type)
..the right Tire for your job!
U. S. ROYAL EARTH MOVER
U. S. ROYAL LOGGER
U. S. ROYAL FLEET DELIVERY
U. S. ROYAL MASTER GRIP
U. S. ROYAL FLEETWAY
IN EVERY SERVICE U. S. TIRES EXCEL

Serving Through Science

UNITED STATES RUBBER COMPANY

1230 SIXTH AVENUE • ROCKEFELLER CENTER • NEW YORK 20, N. Y.

A LOT OF PUMP



IN A SMALL SPACE

In mine locations where space is cramped, Gorman-Rupp self-priming centrifugal gathering pumps will handle the large quantities of water involved, yet take unbelievably small room. Size and capacities are shown here.

Model	Overall Length	Overall Width	Overall Height	Gals. per Hr. at 20' Total Head
40-40	27"	12½"	14¾"	6900
60-60	27"	12½"	14¾"	9600
60-100	34"	17½"	21¼"	10800
125-100	34"	17½"	21¼"	13200

These pumps are ideal for remote locations or automatic operation. No adjustments are required between prime and run. Start the motor and you start the water. Their self-priming is positive and powerful, as shown in an official test where both pump and suction line were dry, yet the pump primed through 300 feet of suction line and was under full operation in three minutes. Sand, muck or solids that will pass the intake cannot clog or harm a Gorman-Rupp. The impeller, on high grade roller bearings, is the only moving part. There are no reduction gears. All this adds up to absolute reliability. When maintenance is finally necessary, all wearing parts can be replaced by an inexperienced man with common tools.

Investigate the possibilities of these modern trouble-free pumps. They are fully described in a special mine bulletin. Write for it today.

THE GORMAN-RUPP COMPANY

306 BOWMAN STREET, MANSFIELD, OHIO

Distributed by: The Bittenbender Company, Scranton, Penna. — Henszey Company, Watertown, Wisc. — Hoe Supply Company, Christopher, Ill. — Industrial Supply Co., Terre Haute, Ind. — Guyan Machinery Co., Logan, W. Va. — Weinman Pump & Supply Co., Pittsburgh, Penna. — Central Supply Co., Greenville, Ky. — Hendrie & Bolthoff Mfg. & Supply Company, Denver, Col. — McComb Supply Company, Harlan, Ky. — Ebbert & Kirkman, Inc., Birmingham, Ala. — John T. Lees, Scranton, Penna. — Ladel Machinery & Conveyor Co., New Philadelphia, Ohio — Union Supply Co., Denver, Col.

it has been announced that special training for prospective mine employees is being extended to the Scranton, Dallas, Berwick, Shickshinny and Tunkhannock offices of the U. S. Employment Service.

Mine manpower shortage is so acute that Manpower Commission officials stated that all able-bodied men who have filed claims for State unemployment compensation after layoffs will be granted a reasonable time to obtain other employment either by their own efforts or through the facilities of the U. S. Employment Service. After a reasonable time, if they are still unemployed, these men will be denied unemployment compensation unless they are willing to accept mine work.

An appeal is being directed to farmers in rural areas to work in mines nearest their farms after harvesting has been completed until time for spring plowing, even though it be only part-time work in the mines.

•

Electric Cable For Mining Use

Development and application of synthetic materials now used in constructing electric cables, was the subject of a talk by R. B. Zane, Chicago district engineer, Okonite Co., at the September meeting of Mining Electrical Group at West Frankfort, Ill.

Some experimental work was done before the war with Japan cut off the supply of natural rubber. After that, Buna S, which is unlike natural rubber in many respects, had to be used to make up the deficiency. Early results were disappointing, but persistence won success. Among the definite improvements are higher dielectric strength, higher test voltage applied to find defects and a neoprene compound jacket which stands many times the abuse that braided jacket will withstand.

For cables carrying 2,000 volts and above, 19-strand construction has been adopted as standard instead of the former 7-strand. This changes the sharply indented line of stress to a rippled line with lower peak stresses. The Okonite Co. calls this Class "C" stranding. A semi-conducting tape is wound over this stranding to bind the wires together. It helps the dielectric strength and reduces the tendency of the wires to birdcage from bending.

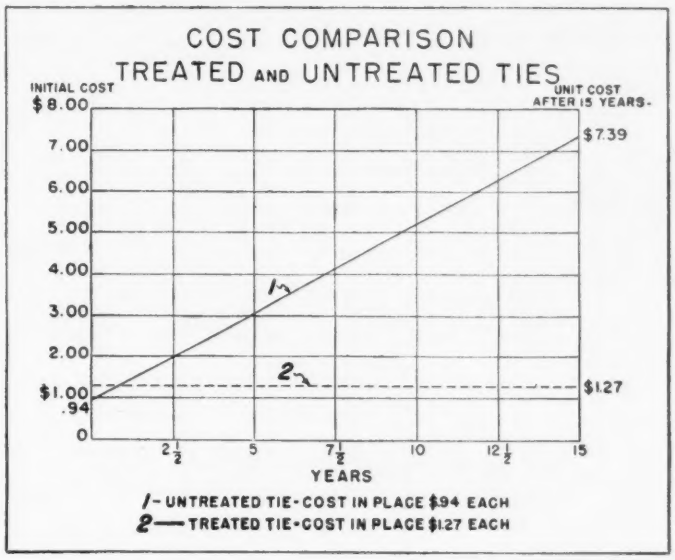
A.c. test voltages were boosted 25 percent but results were not satisfactory. A kenatron was then tried. Now, test voltages of two or three times that used with a.c. prove to be more satisfactory.

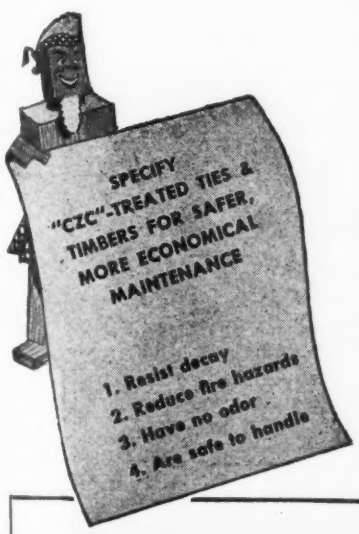
For jacket material on cables carrying up to 5,000 volts, a neoprene compound is used that is far superior to a braided covering. The wearing qualities of this smooth jacket is many times that of a braid, according to Mr. Zane. Highly weather-resistant and oilproof, it will lay in water, does not discharge corona up to 5,000 volts and does not check. Its insulation value is 400 volts per mil of thickness.

For cables carrying above 5,000 volts, a copper shield is wrapped around each conductor and a braid over that. This pro-

When is 94¢ more than $1.27?

The Answer is seen at a glance in the chart below. But there's much more to the story . . .





This chart is one of many in the booklet, "Wood Preservation for Mines," published by Du Pont, and sent to you free on request. It tells how your haulage ties and other mine timber may be impregnated with CZC (Chromated Zinc Chloride) to resist decay, and reduce fire hazards and operating costs over a period of time. It shows just how much you can save in any given number of years through the use of CZC.

As a mine man, the information contained in this booklet should be interesting whether or not you can get new timber today. For your copy, fill out and send the coupon below.

TO CONSERVE—PRESERVE!

DU PONT CZC

(CHROMATED ZINC CHLORIDE)

WOOD PRESERVATIVE

DU PONT REG. U. S. PAT. OFF.

BETTER THINGS FOR BETTER LIVING
...THROUGH CHEMISTRY

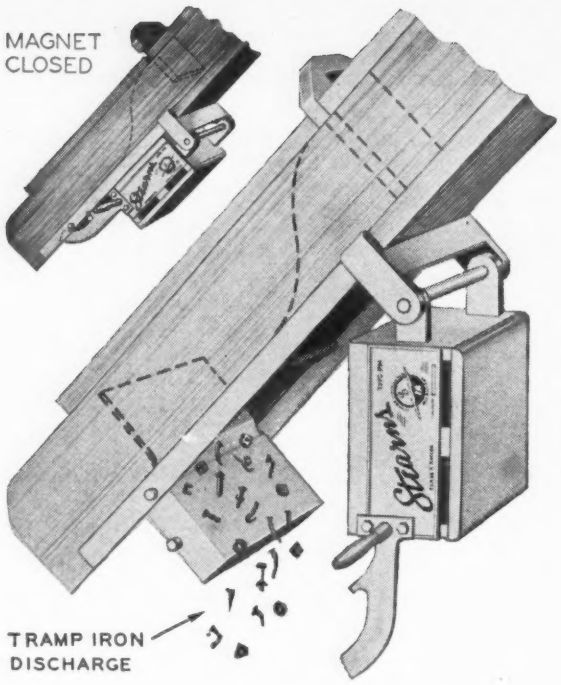
E. I. du Pont de Nemours & Co. (Inc.), Grasselli Chemicals Department, Wilmington 98, Delaware.

Please send me your booklet, **"Wood Preservation for Mines."**

Name_____

Address_____

City or Town_____ State_____



Stearns

PERMANENT
MAGNET Spout Separator

REASONS WHY YOU SHOULD MAKE IT A STEARNS

- Fully automatic in operation
- No manual removal of tramp iron
- Tramp iron is automatically discharged
- The separator with a trap gate
- A separator with double gap to provide two magnets in one unit
- Has Mill Mutual Class "A" rating
- Held in operating position by magnetic attraction
- Positive action of trap gate, open or closed
- No electrical current needed, furnished complete and can be installed by anyone
- Backed by two generations of experience, your guarantee of satisfaction

Stearns

STEARNS-MAGNETIC MILWAUKEE

MAGNETIC MFG. CO.

PULLEYS—DRUMS—ROLLS
CLUTCHES—BRAKES—MAGNETS

661 So. 28th Street, Milwaukee, Wis.

duces radial stresses with high resistance to surges. It is important that shielding be grounded, whether it is copper, asbestos saturated with some binding compound or neoprene compound.

D.c. cables for low voltage underground service jacketed with neoprene compound are recommended for portable use as highly resistant to dragging around, withstanding falls and rough handling. Not only will it stand more abuse than braid but wire failure may be expected long before failure of rubber from flexing may occur. Mr. Zane declared that while it costs more than braid, it is worth more.

•

Urges 5c Tax On Penna. Bituminous

Councilman William F. Bert of Washington, Pa., proposed Sept. 22 a legislative levy of 5c. a ton on all bituminous coal produced in Pennsylvania to provide local revenue for a public works program. Copies of the proposal, calling for a distribution of funds similar to that of the Pennsylvania gasoline tax, which reverts to local communities, have been sent to Governor Martin and members of the Legislature.

"The post-war unemployment problem will necessitate an expanding State and local public works program," said Mr. Bert. "The 5c.-per-ton levy would work no hardship on anyone. It would cost the average individual consumer not more than a dollar a year." The councilman declared such a levy would reduce real estate taxes, in some cases as much as 50 percent.

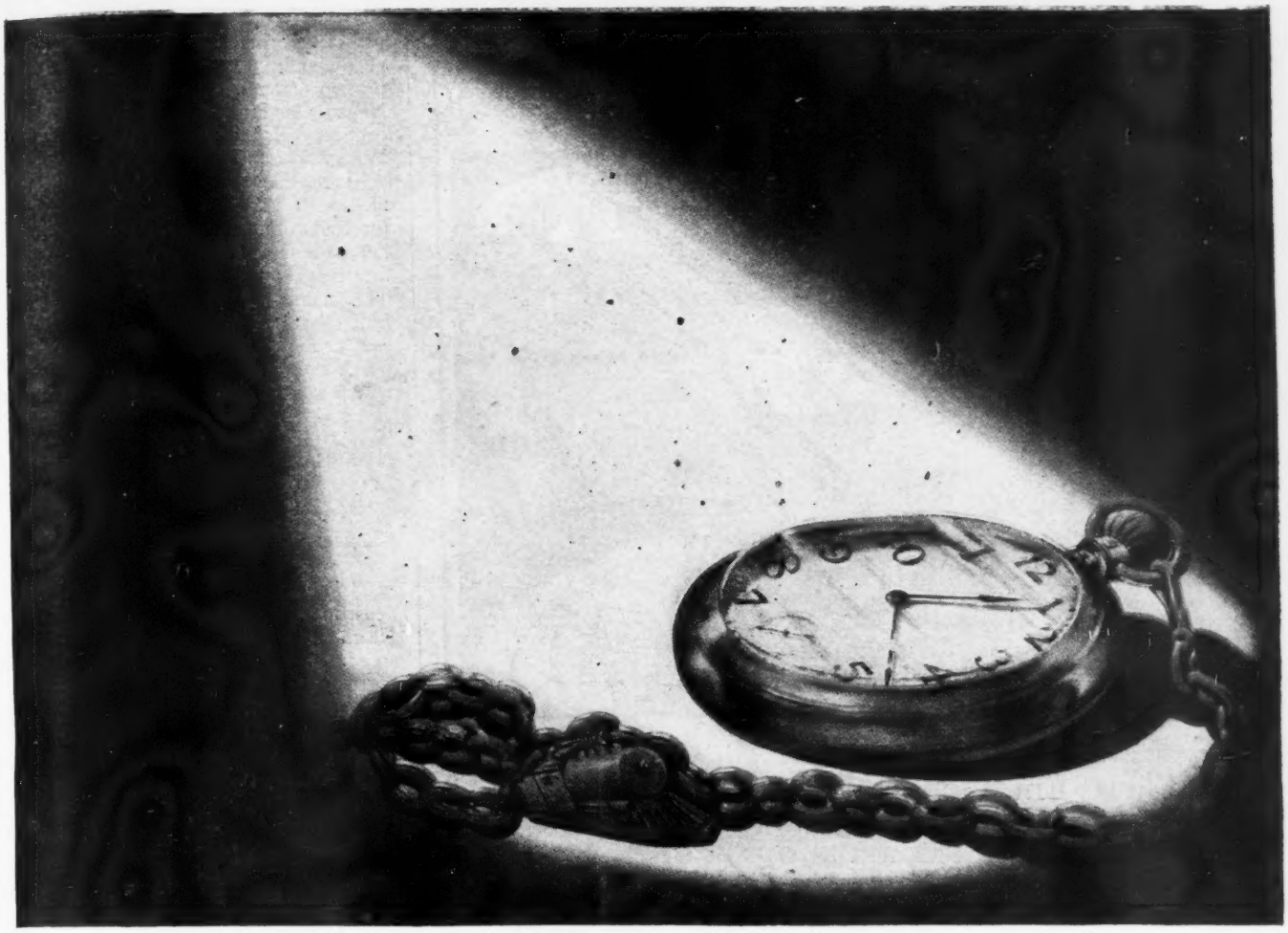
•

Propose Natural Gas For Wisconsin

Milwaukee Gas Light Co. and others interested are laying plans for introduction of natural gas into Wisconsin by October, 1947. A resolution adopted by the Milwaukee Council provides for construction of a $70,000,000 pipeline from the Hugoton gas field in Oklahoma to begin next March. The line is to be put into service 17 months later, and 3,000,000,000,000 cu.ft. of gas, estimated to be enough for 30 years, is to be made available by Phillips Petroleum Co.

An unsuccessful attempt was made in the 1945 State Legislature to repeal a State law taxing natural gas 7c. per 1,000 cu.ft. and to modify the law requiring permission from communities before natural gas can be brought in. Taking steps to meet the requirements of the law, the gas company has obtained permission from 36 of the 39 communities in which it operates to bring in natural gas. Although the company has made no announcement of its plans, resolutions adopted by cities, villages and towns indicate it intends to ask the Public Service Commission of Wisconsin for authority to bring in natural gas.

The Federal Power Commission has entered an order granting a certificate to the Wisconsin Southern Gas Co. authorizing it to construct pipeline facilities to make

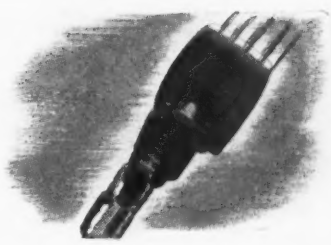


Wire rope *Dependability* means low cost usage!

Unless the wire rope you select has the *reserve dependability* that provides for an *ample* factor of safety, it will become a costly purchase. Selection of the *right* rope means long, low-cost service... true economy!

Dependability, safety and long, low-cost performance of Wickwire Rope starts with the production in our own open hearth furnaces of the correct composition of steel for use in each rope. Here, wire-steel characteristics can be accurately predetermined by the scientific blending of the proper ingredients in the correct percentages to produce the one wire rope best suited for your specific purpose.

At Wickwire *every* step in wire rope manufacture is carefully scrutinized. Special control is exercised through each successive wire drawing operation, and right through to the final laying of every type, size and construction of wire rope. This close watch over quality assures the utmost in wire rope dependability and long service.



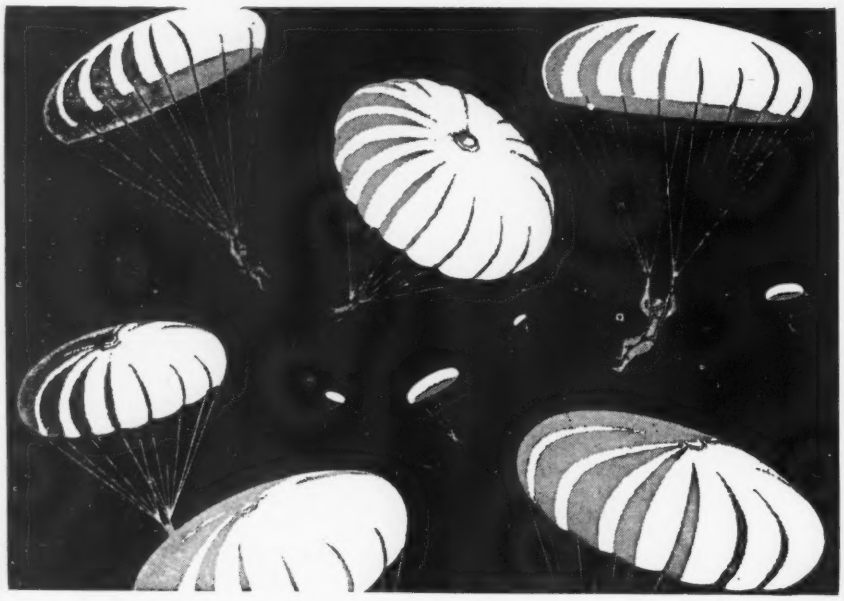
Thousands of wire rope users—old hands and new—have found our specially prepared manual, "Know Your Ropes" valuable in making their work easier and prolonging rope life. It contains 78 "right and wrong" pictures, 40 wire rope life savers, 20 diagrams, tables and charts. Send for your FREE COPY today.

WICKWIRE SPENCER *Steel Company*

500 FIFTH AVENUE, NEW YORK (18), N. Y.

ABILENE (TEX.) • BOSTON • BUFFALO • CHATTANOOGA • CHICAGO • CLINTON (MASS.) • DETROIT • HOUSTON • LOS ANGELES • PHILADELPHIA • SAN FRANCISCO • TULSA • WORCESTER

Accidents .. Sickness .. Death



These Emergencies Hit
like paratroops
descending
in the night!

That's why more and more Employers throughout the Coal Mining Industry are making available to Employees a dependable Provident Plan designed to help Employees meet these income-crippling disabilities.

HUMAN SECURITY

- Death in family
- Death of Employee
- Loss of time through Accident or Sickness
- Dismemberment

EMERGENCY INCOME

PROVIDENT LIFE AND ACCIDENT INSURANCE COMPANY

Since 1887

CHATTANOOGA 2, TENNESSEE

Pioneers in Providing Protection for Employees of the Coal Mining Industry

natural gas available in the southern part of Wisconsin. At the same time the Commission entered an order requiring the Natural Gas Pipe Line of America to interconnect with the proposed facilities of the Wisconsin Southern.

Tennessee Natural Gas Lines, Inc., has filed with F.P.C. an application for authorization to construct and operate a pipeline to make natural gas available for the first time in the city of Nashville, Tenn. The company proposes to purchase gas from the transcontinental trunk line of the Tennessee Gas & Transmission Co., which runs within about 14 miles of Nashville, a contract having already been entered into for the gas, according to the application.

•

Department Store Sells Stokers

Claiming to be the "first and only department store in America" to sell it, Hearn's, New York City, announced in an advertisement 14 in. x 5 columns Sept. 16 that it was the sole agent in its trading area, including Greater New York, for the Link-Belt anthracite stoker. Asking no down payment and allowing up to 18 months in which to make payment, the store offered either bin-fed or hopper models, with the free advice of trained engineers on the proper model to choose and quick installation to the extent of the limited number being produced.

Models are on display at Hearn's two stores, in Manhattan and the Bronx, and in a showroom at 185 Montague St., Brooklyn.

•

Power Company Plans New Anthracite Plant

Pennsylvania Power & Light Co. will build a 140,000-kw. anthracite-burning steam electric-generating plant on the Susquehanna River near Sunbury, Pa., as part of a $65,000,000 five-year improvement program. Already the largest utility consumer of anthracite, the new plant will materially increase the tonnage burned.

•

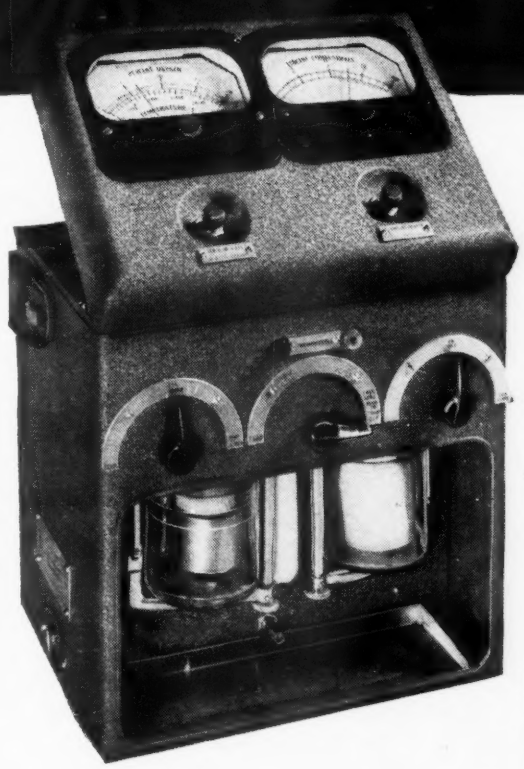
Study Direct Use Of Coal for Gas Turbines

A direct method of utilizing coal as the source of energy for turning gas turbines is being studied by engineers of Battelle Memorial Institute, Columbus, Ohio, in a program of research sponsored by the Locomotive Development Committee of Bituminous Coal Research, Inc. The objective of the research is the development of a revolutionary means of locomotive propulsion, which would give locomotives the advantages of both the high thermal efficiency of the gas turbines and the low cost of bituminous coal. Such locomotives would be smokeless, steamless and without the limitations on speed and power of the reciprocating-type locomotives.

In the design being studied by Battelle

How efficiently are you Burning Fuel?

YOU CAN FIND OUT—IN JUST A FEW MINUTES—WITH THE CITIES SERVICE INDUSTRIAL HEAT PROVER



This unique instrument indicates simultaneously the percentage of unburned fuel, or oxygen present in the flue gases.

With this data the Cities Service engineer can show you at once how to *save* on fuel costs.

The Industrial Heat Prover has been applied with uniformly successful results to every kind of fuel and to every type of combustion equipment in this country.

Also used successfully for controlling furnace atmospheres in the heat treatment of steel.

For a demonstration of the Industrial Heat Prover on your own equipment, contact your nearest Cities Service office or mail the coupon below.

MAIL THIS COUPON TODAY

(Available only in Cities Service Marketing Territories East of the Rockies)

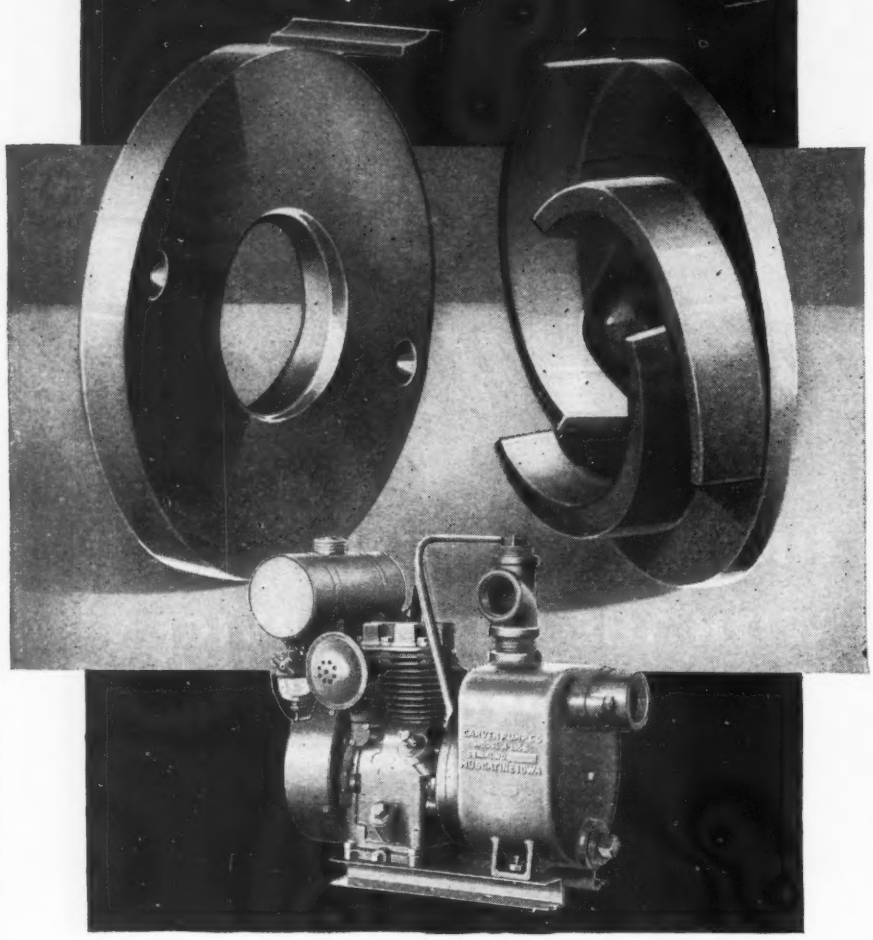
Cities Service Oil Co.
Room 448, 70 Pine Street
New York 5, N. Y.

Gentlemen: Please send me further information on the Cities Service Industrial Heat Prover—at no obligation to me.

Name .....
Title .....
Company .....
Address .....
City ..... State .....

CITIES SERVICE OILS
ONCE-ALWAYS

built for the *Toughest* service



● Every feature of Carver Pumps is designed to withstand the toughest operating conditions. Impellers are scientifically designed with web-reinforced vanes confining wear to one side. Renewable liners carry a cast lug protecting the scroll casing at the impeller cut-off where wear is greatest. Both parts are cast from special alloy and ground to close tolerance to keep performance high. When wear eventually occurs, their quick, low-cost replacement makes the pump as good as new.

THE CARVER PUMP CO.
Muscatine, Iowa

CARVER CENTRIFUGAL *Certified* PUMPS

engineers, coal in pulverized form would be burned under pressure to give hot gases. These gases would be used to drive turbines which would propel the locomotive. The intermediate step of steam generation, used in connection with modern steam-turbine locomotives, would be eliminated.

The Battelle study is part of a $1,100,000 research program on locomotive development shared by several research institutions. It is supported by six major railroads and three large coal companies. John I. Yellott is director of research of the Locomotive Development Committee, with headquarters in Baltimore, Md.

•

Anthracite Men Named For Coal Conference

A committee to represent anthracite interests in promoting the Joint Fuels Conference of the American Society of Mechanical Engineers and the American Institute of Mining and Metallurgical Engineers was named at a recent meeting of the executive committee of the Anthracite Section of A.L.M.E. held at Hazelton, Pa. M. C. Butler, chairman of the Anthracite Section, named the following: H. W. Montz (chairman), W. B. Geise, Harry Otto, Evan Evans, W. B. Wells and C. A. Garner. The Fuels Conference will be held Nov. 1 and 2 at the Bellevue-Stratford Hotel, Philadelphia.

•

No Withholding On Occupation Expenses

In response to requests for advice on treatment of occupational expenses, the Bureau of Internal Revenue has released I.T. 3755, according to which the Treasury holds that amounts representing charges or expenditures for explosives, fuses, cartridge paper, detonating caps, lamps (and batteries and belts for use in connection therewith), smithing service, tools, miners' checks, self-rescuers and safety clothing, used in mining operations, do not constitute wages subject to withholding of income tax at the source.

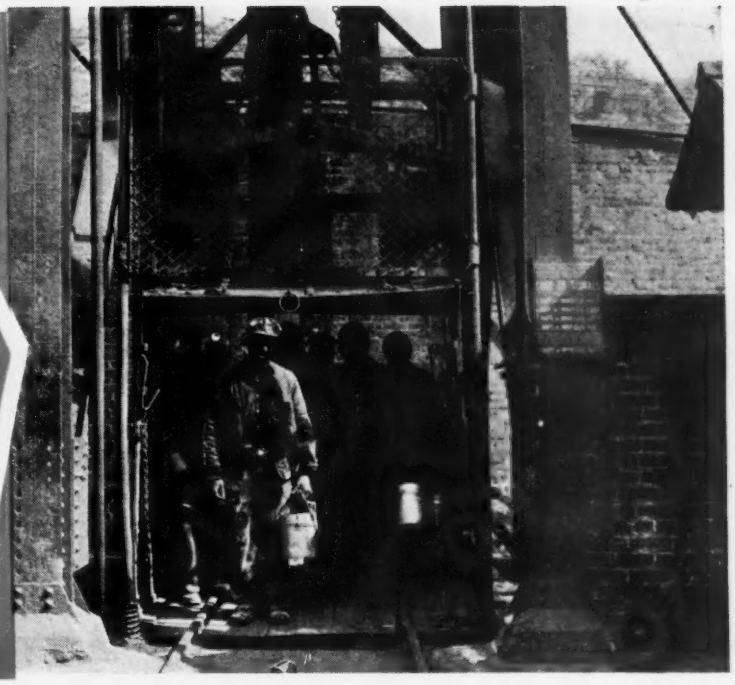
•

N.C.A. Tax Committee Names L. H. Parker

The National Coal Association tax committee met Sept. 5-7 in Washington to consider the complete federal tax picture as it affects the bituminous coal mining industry and arrange for preparation of its report and recommendations for presentation to the officers of the association. L. H. Parker, formerly chairman of the Joint Committee on Taxation of Congress, now a tax consultant in Washington and for a number of years tax adviser to N.C.A., was elected chairman of the committee. James W. Haley, N.C.A. Washington office, was reelected secretary.

Three main committees named were: Rates and Policy—H. L. Smith (chairman), A. E. Lamm, David N. Lewis, G. G. Crowder. Technical Provisions—John

KEEP THEM ON THE JOB!



"Bureau of Mines Photo"

There's only one way to meet today's unprecedented coal production quotas —keep your men on the job! Modern mechanized mining equipment will do much to increase tonnage output, if manpower is there to operate it. That's why proper ventilation is important to you as a mine operator.

Ventilation serves two purposes: it makes mining safer and it provides better working conditions. *Good* ventilation means fewer absences due to injuries, sickness and fatigue; keeps men on the job, producing coal. And *good* ventilation means La-Del Axial Flow Fans, designed for maximum efficiency and low cost operation. Let La-Del ventilation engineers analyze your mine ventilation requirements and show you how proper ventilation can increase production and lower operating costs at the same time.

OUTSTANDING FEATURES OF LA-DEL FANS:

- **Rigid straightening vanes for true axial flow.**
- **Streamlined tail to maintain uniform axial flow without turbulence.**
- **Compact, space-saving, for economical installation.**
- **Dependable performance, free from maintenance troubles and expense; control ease; quiet operation.**

La-Del Equipment For The Mines

Belt Conveyors • Shaker Conveyors • Chain Conveyors Elevating Heads • Pit Car Loaders • Mobile Loading Machines • La-Del Trailer Mine Ventilating Fans and Blowers and La-Del Experienced Engineering Counsel . . . Before and After Installation.

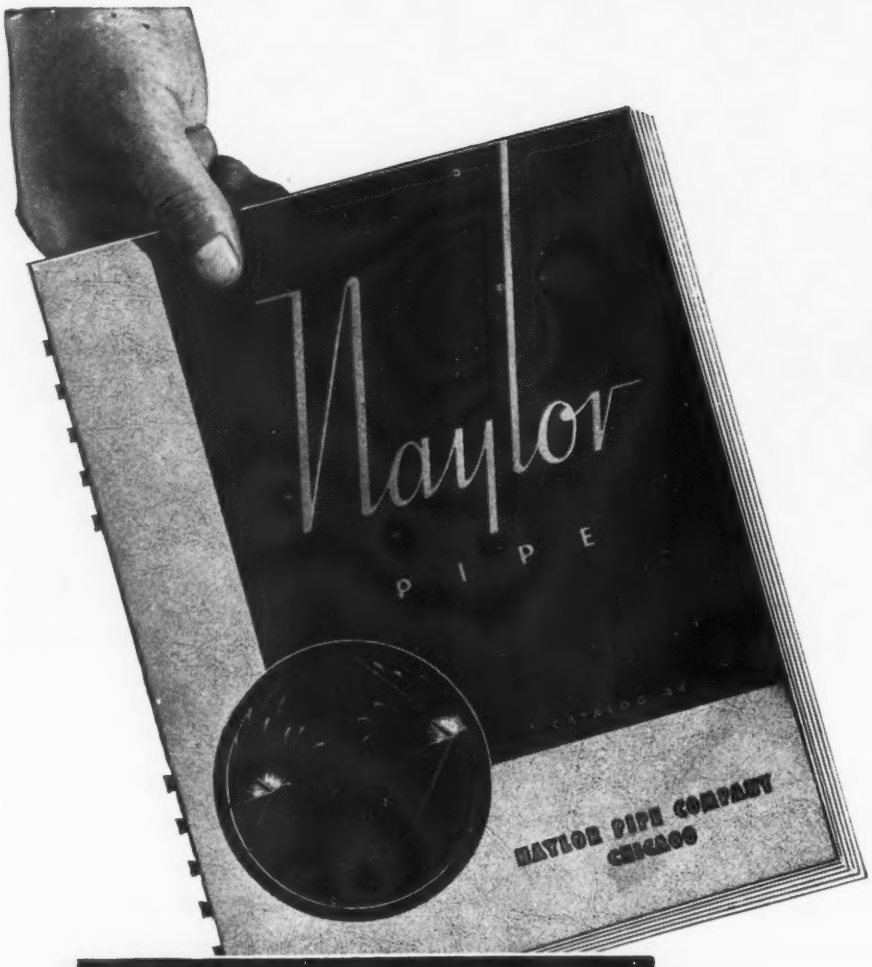
MATERIAL HANDLING LA-DEL MINE VENTILATION

Now, More than ever, your War Bond Purchases count!

LA-DEL CONVEYOR AND MANUFACTURING CO.

New Philadelphia, Ohio

COMPLETE LINE OF UNDERGROUND CONVEYORS FOR LOW COST OPERATION



POST-WAR GUIDE FOR PIPE USERS

On what applications can light-weight pipe do a better job for you? Why does Naylor Pipe provide advantages found in no other light-weight pipe? What new Naylor development has revolutionized pipe coupling? The answers to these and many other questions of importance to you are presented in the new Naylor Catalog just off the press. Here is a practical guide that provides a working tool for everyone planning post-war piping.

Write for your registered copy today!

NAYLOR LOCKSEAM SPIRALWELD PIPE

NAYLOR PIPE COMPANY
1268 EAST 92nd STREET, CHICAGO 19, ILL.
New York Office:
350 Madison Ave., New York 17, N. Y.

Auch (chairman), W. H. Peter, L. R. Colwell, David N. Lewis, Elmo E. Allen, Kenneth F. F. Towler, William Huff Wagner (consultant). Social Security—G. W. Kratz (chairman), Roy O. Park, H. E. Lohmann, G. G. Crowder.

•

High Schools to Have Coal Mining Courses

High school students at Smithfield, Jefferson County, Ohio, found a new course in their roster of studies when the fall term opened in September. The new course covers all phases of coal mining—said to be the first of its kind in Ohio.

Plans have been adopted for establishing a course in anthracite mining as a major branch of the vocational training system in Shamokin (Pa.) High School. Initiated in conjunction with the mining industry, which has offered to supply the necessary equipment for practicable instruction for boys electing to take the course, it will start at the opening of the next school term.

•

Wage-Hour Hearings Start in Senate

Hearings, to last about two weeks, began Sept. 25 on Senator Claude Pepper's (D., Fla.) bill, S. 1349, to amend the Fair Labor Standards Act. In addition to increasing the statutory minimum wage to 65c. an hour, with an automatic boost to 70c. one year after enactment and to 75c. two years after enactment, the measure contains a section that would authorize the Administrator to fix wage-rate structures, possibly far in excess of the statutory minimum, by establishing wage differentials "between interrelated job classifications based on the recommendations of industry committees."

An important provision also is the section setting five years as the maximum within which employee suits for unpaid wages, overtime and liquidated damages may be brought. Such a provision, it is pointed out, would nullify the one-year limitation proposed in the Gwynne bill, now before a House Judiciary subcommittee, and likewise would nullify State laws, most of which provide limitations much less than five years.

•

John Mayhew Heads Kentucky Institute

John Mayhew, superintendent, Blue Diamond Mine of the Blue Diamond Coal Co., Perry County, Kentucky, was elected president of the Kentucky River Mining Institute at a meeting held Sept. 22 at the Grand Hotel, Hazard. Other officers are: first vice president, Warren Haydon, superintendent, Hardy-Burlingham Mining Co.; second vice president, W. E. Pendleton, manager, Kentucky Blue Grass Mining Co.; secretary, J. B. Allen (reelected); and the executive committee: John M. Woods, superintendent, Glomawr Mine, Hatfield-Campbell Creek Coal Co.; H. M. Gallehar,

Keep your cutters on the job with these

CUSHIONS AGAINST SHOCK LOADS!

STRONG OIL FILMS FOR CUTTER-HEAD DRIVE GEARS

As your cutters slash into the coal face, the heavy shocks are transmitted back to the oil-lubricated cutter-head gears. This calls for a special oil that will cushion the meshing gear teeth with strong oil films. You'll find that Gargoyle Vactra Oils meet this condition, protect gears longer, help keep your cutters at the face.

LUBRICANT THAT STAYS ON BOOM ROLL-OVER GEARS

Here, in the boom roll-over, gears and bearings operate under heavy pressures. You need a lubricant that will resist these pressures. For certain type models, Socony-Vacuum recommends Gargoyle Viscolite Oil SS; for other models, the correct recommendation is Gargoyle Grease Kalrex No. 1. Your local representative will help you select the correct lubricant for your individual machine.

STABLE HYDRAULIC FLUID FOR LIFT, TILT AND SWING CYLINDERS

You can't be too careful in selecting the oil for your cutter hydraulic system. For this oil not only must resist oxidation but also must separate readily from water. Get highly stable Gargoyle Vactra Oil for this purpose.

SOCONY-VACUUM OIL CO., INC., Standard Oil of N.Y. Div. • White Star Div. • Lubrite Div. • Chicago Div. • White Eagle Div. • Wadhams Div. • Magnolia Petroleum Company • General Petroleum Corporation of California.

GARGOYLE Lubricants

SOCONY-VACUUM'S 5 Steps to Lower Production Costs:

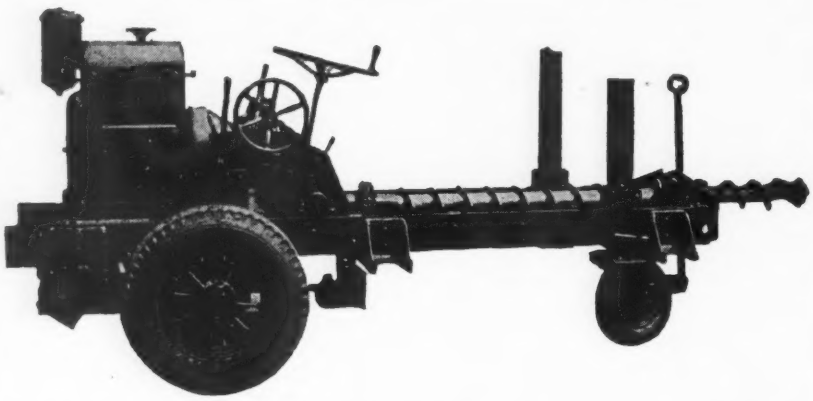
1. Lubrication Study of Your Entire Plant
2. Lubrication Schedules and Controls
3. Lubricant Storage and Handling System
4. Skilled Engineering Counsel
5. Progress Reports of Benefits Secured

Tune in "Information Please"—Monday Evenings, 9:30 E.W.T.—NBC

PARMANCO Horizontal Drills

"Positive Control Drilling"

Parmanco Horizontal Drills give you "Positive Control Drilling." Parmanco Vertical and Horizontal Drills are today's leaders in low cost, low maintenance drilling—All Parmanco Drills are equipped with patented Parmanco augers. Used by leading strip mine operators—Write us your drilling problems.



PARIS MANUFACTURING CO.

PARIS, ILLINOIS

Mescoweld Rail Bonds

Famous for many years

Positive conductivity assured by flashwelding each wire to heavy wrought steel terminal. Every requirement for rail bonding provided for by eighteen types of which M8-F is illustrated. Immediate deliveries.

WRITE FOR CATALOG — PHONE HEmlock 8332

MOSEBACH

ELECTRIC & SUPPLY COMPANY

1115 Arlington Avenue Pittsburgh, Pa.

superintendent, Harvey Coal Corp.; P. A. Grady, general superintendent, Carrs Fork Coal Co.; R. C. Watts, superintendent, Kenmont Coal Co., and M. A. Emmons, manager, Meem-Haskins Coal Corp.

At the meeting L. W. Huber, district manager, Mine Safety Appliances Co., Lexington, presented a talk on mine ventilation. The Kentucky River Mining Institute was organized in January, 1926, and has been holding regular meetings ever since the start. As set forth in the original constitution and bylaws, the end objects of the institute are to: (1) prevent accidents, (2) prevent willful waste of materials, (3) prevent willful waste of time, (4) promote better preparation and (5) give each member the benefit of discussions or plans leading to lower costs of mining. Mr. Allen has been secretary since 1930.

•

Uncertainty Reigns Over Canada's Supply

Considerable anxiety is felt by Montreal coal importers over possible nationalization of the British coal mining industry. Several Canadian coal importers already have shown their concern by sending high ranking representatives to Britain to canvass the situation.

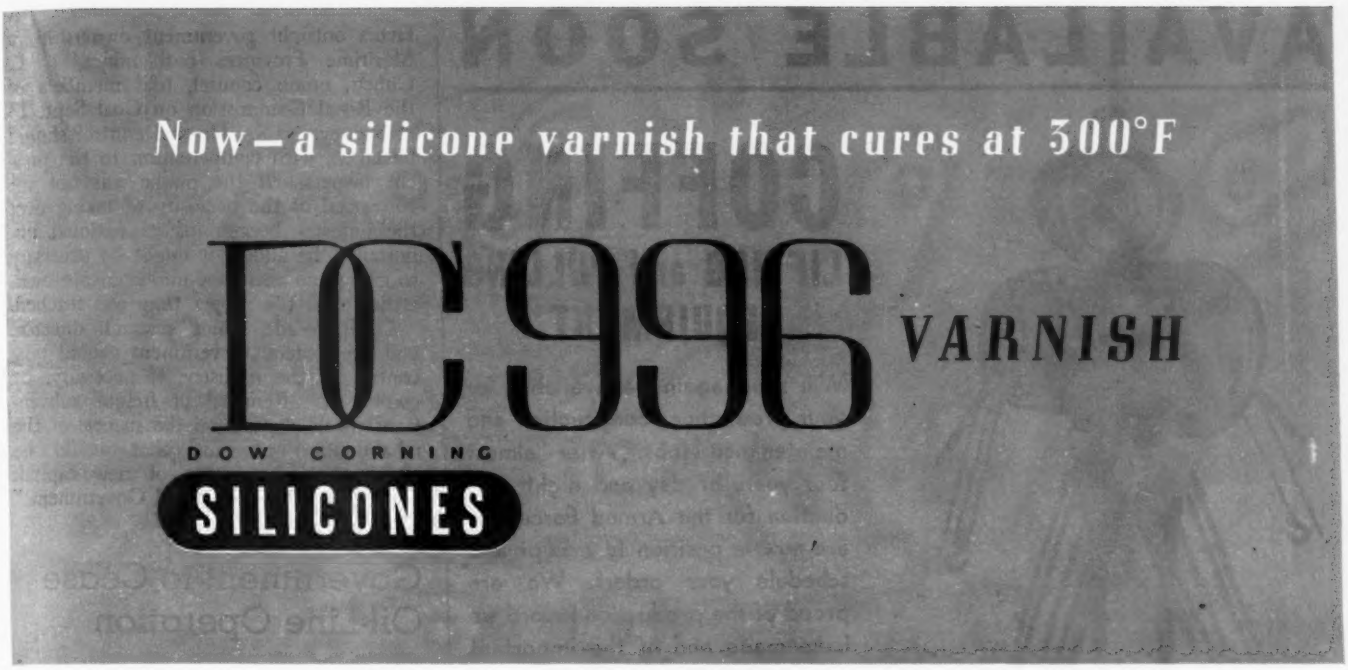
Apart from nationalization, present indications are that not more than 50,000 tons of British coal will come to Canada this year, the greater part of which will be required in the Maritime Provinces. Prewar imports from Britain averaged well over 1,000,000 tons annually; 1937 figures, for instance, showing 1,500,000 tons of British coal imported into Canada. Ontario and Quebec, with no coal production of their own, consume one-half of the Dominion's total supply and consequently will continue to be hardest hit by the prospective shortage.

Spurred by appeals from district and local officers, a concentrated drive is being made in the Cape Breton (N. S.) coal fields to increase production. Freeman Jenkins, president of District 26, United Mine Workers of America, and International Board Member John A. MacDonald have both addressed the miners lately, urging them to boost the per capita output.

The volume of coal that has arrived in Vancouver, B. C., from Alberta since the first of the year has removed the threat of shortage this winter in city homes. Tom Marshall, western representative of the Coal Controller, states that, in view of shipments in the last eight months, "we don't anticipate any real emergency in Vancouver." Indications, he added, are that more than 50 percent of householders already have filled their coal bins.

Government mines in Alberta also have been shipping coal to eastern Canada to ease the situation presented by the likelihood that U. S. shipments to Canada will be curtailed. While the labor supply at the mines is still tight, Mr. Marshall predicted that there would be an improvement with the return of many veterans from the army by the year's end.

District 26, United Mine Workers,



Dow Corning 996 is an electrical impregnating varnish for low temperature baking.

Dow Corning 996 was developed to provide manufacturers of new equipment and rewinders of old equipment with a heat resistant, waterproof silicone varnish which can be cured at temperatures obtainable in ovens now used for curing organic insulating varnishes.

Dow Corning 996 is used as the dipping or impregnating varnish for equipment wound with typical silicone insulation components. These include Fiberglas cloth, tape and sleeving varnished with DC 993; silicone bonded mica-Fiberglas for ground insulation; silicone bonded Fiberglas served magnet wire; silicone-Fiberglas laminated coil separators and slot sticks, and Silastic* coated lead wire.

Electrical equipment, wound with silicone insulating components and sealed by impregnating with DC 996, will have the high order of thermal stability and retention of waterproofness characteristic of silicone insulation.

Dow Corning 996 thus enables all types of electrical shops to realize the advantages of silicone insulation. It is recommended for use in equipment which is to be operated at temperatures up to 175°C. (347°F.). For higher operating temperatures, or extremely severe service conditions, DC 993 should be used throughout. The same methods of dipping, spraying, or vacuum-pressure impregnating that are used for applying conventional organic varnishes can be used with DC 996.

PROPERTIES—Dow Corning 996 is furnished as a 50 per cent by weight solution in an aromatic solvent and has a viscosity of 2 to 5 poises. In this consistency DC 996 is suitable for impregnating electrical equipment. It can be reduced to any desired viscosity with aromatic naphtha.

Dow Corning 996, when coated on metal, air dries to a slightly tacky, soft film. Baking the coated panel at 150°C. (302°F.) for a period of four hours will cure the coating to a non-flowing, tack-free, flexible film. DC 996 has ample heat stability for continuous use at temperatures as high as 175°C. or for intermittent use at higher temperatures.

ELECTRICAL PROPERTIES OF DC 996—(measured on coated panels at 25°C. and 50% relative humidity.)

Dielectric Strength, volts per mil	1500 to 2000
Dielectric Constant, at 1000 cycles	3.0
Power Factor, at 1000 cycles	0.7%

DOW CORNING CORPORATION
MIDLAND, MICHIGAN
NEW YORK OFFICE: EMPIRE STATE BUILDING

DISTRIBUTED BY

Electrical Specialty Co.	San Francisco
Prehler Electrical Insulation Company	Chicago
Insulation Manufacturers Corporation	Chicago
Insulation and Wires, Incorporated	St. Louis
Mica Insulator Company	Schenectady
National Electric Coil Company	Columbus
Westinghouse Electric Corporation Insulation Section, Micarta Division	Trafford, Penna.

* Trade name for Dow Corning Silicone Rubber

Dow Corning
FIRST IN SILICONES

AVAILABLE SOON

COFFING
LIFTING and PULLING EQUIPMENT

Will soon again be available for your production, construction and maintenance jobs. After almost four years of day and night production for the Armed Forces we are now in position to accept and schedule your orders. We are proud of the production record we have made and of the important part COFFING products played in helping to restore Peace on Earth. Our standard line of hoists were used by our fighting men so there is no reconversion period for us.

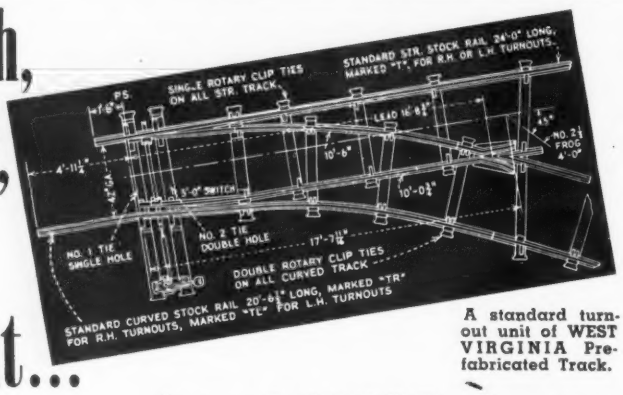
Write for Folder No. 4

COFFING HOIST COMPANY
Danville U.S.A. Illinois

A Wrench, Hammer, and a Blueprint... that's all you need to move

WEST VIRGINIA

Prefabricated Track!


SINGLE ROTARY CLIP TIES ON ALL STR. TRACK
STANDARD STR. STOCK RAIL 24'-0" LONG, MARKED "T", FOR R.H. OR L.H. TURNOUTS
LEAD 16'-8½"
NO. 2½ FROG 4'-0"
10'-6"
10'-0½"
NO. 1 TIE SINGLE HOLE
NO. 2 TIE DOUBLE HOLE
17'-7½"
DOUBLE ROTARY CLIP TIES ON ALL CURVED TRACK
STANDARD CURVED STOCK RAIL 20'-8½" LONG, MARKED "TR" FOR R.H. TURNOUTS, MARKED "TL" FOR L.H. TURNOUTS

A standard turnout unit of WEST VIRGINIA Prefabricated Track.

In an actual installation three men moved WEST VIRGINIA Prefabricated Track from 1½ rooms and delivered it to a new location in one shift. Almost no surfacing is required and derailments are practically nonexistent. Obviously you'll get more coal out faster on every shift with WEST VIRGINIA Prefabricated Track on the job! Write for full details.

WEST VIRGINIA STEEL & MFG. COMPANY
Formerly The West Virginia Rail Company
HUNTINGTON WEST VIRGINIA

favors outright government ownership of Maritime Provinces coal mines, J. L. Cohen, union counsel, told members of the Royal Commission on Coal Sept. 13 at Sydney, N. S. He said control should be taken, with compensation to the present owners. If the public was not yet convinced of the necessity of taking over the industry because of its national importance, he added, it might be necessary to give some assistance under private ownership until the proper time was reached.

C. B. Wade, union research director, said the Federal Government should take control of the industry; if necessary, by owning it. Removal of freight subventions would depend on the success of the rehabilitation program, that would be based on the provision of new capital, "presumably by the Federal Government."

•

Government to Cease Oil-Line Operation

Operation of five government-owned oil pipelines, including the "Big Inch" and "Little Inch," is to be discontinued within the next 30 to 60 days, it was announced Sept. 14 by the Reconstruction Finance Corp., which is reported to be inviting negotiations for the lines either on a purchase or lease basis.

As soon as the crude in the feeder lines and various storage tanks, together with the quantity of crude that was purchased in September, has been transported through the Big Inch the remaining crude in the line will be delivered to the Eastern Seaboard by pumping water through the line and replacing the water with properly treated inhibitor to preserve the line.

•

Branch Lines Authorized

Construction by the Clinchfield Ry. of a line of railroad in Dickenson County, Virginia, and its operation by the Atlantic Coast Line and the Louisville & Nashville R. R. is authorized by a certificate issued by the Interstate Commerce Commission. It also authorizes construction by the Chesapeake & Ohio Ry. of a line in Letcher County, Kentucky, and Wise County, Virginia. The lines will serve coal mines in the Mead Fork area and also in the Pound River Valley region. The I.C.C. order provides that construction shall begin on or before Dec. 1, 1945, and be completed on or before Dec. 1, 1946.

•

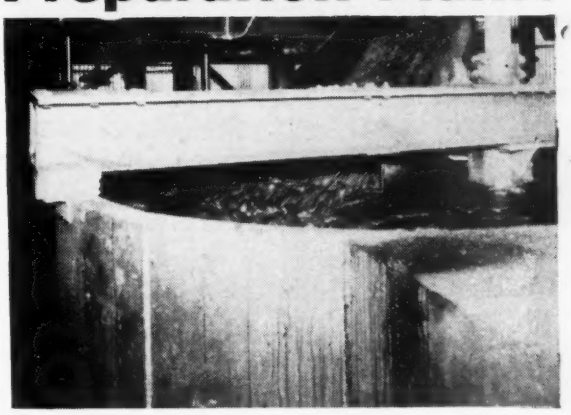
Must Drain Strip Pits

Persons or companies engaged in strip mining in Alabama must drain pits left by their work so as to eliminate mosquito-breeding conditions, according to a ruling by Attorney General Robert B. Harwood of that State. He also said that the State Health Department had authority to enforce rules requiring the drainage of pits "likely to impound water which would be dangerous to the public health."

...get all 3 with a FAIRMONT-designed Preparation Plant!

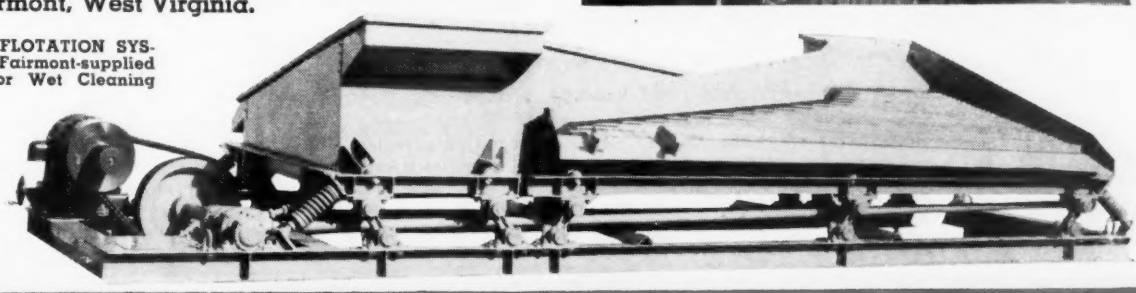
Engineer low-cost operation and higher production into your plant and greater sales potential into your product! You can do it with a FAIRMONT-installed Preparation System . . . and you'll be ready to meet daily-increasing demands for specification fuel. FAIRMONT Engineers will help you analyze your present preparation methods and suggest possible improvements or revisions to help you produce premium-price coal.

The FAIRMONT Company services encompass the designing and construction of complete Preparation Systems for the handling of every type of coal. Write for helpful counsel. Address FAIRMONT MACHINERY COMPANY, Fairmont, West Virginia.



THE CHANCE SAND FLOTATION SYSTEM shown at top, a Fairmont-supplied unit, is available for Wet Cleaning requirements.

THE AMERICAN PNEUMATIC SEPARATOR, below, also Fairmont-supplied, for highly efficient Dry Cleaning.



TRADE MARK REGISTERED

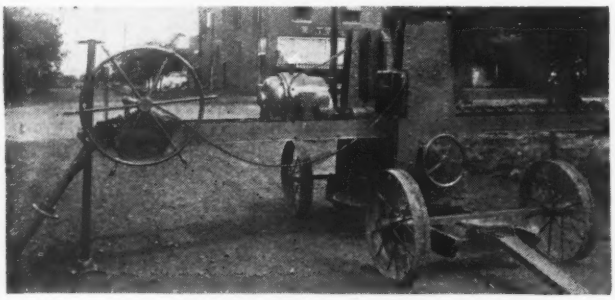
FAIRMONT MACHINERY COMPANY

Find out how this

"UNITED" Horizontal Drill

can do that bigger job for you

● Let us give you complete details on the performance of this Horizontal Drill whose design represents years of practical experience. Drill Frame is movable up and down in a range of 4 feet. It also can be set at an angle which allows the frame to turn 360°. It is powered by an electric motor or gasoline engine. Mounted on steel wheels or rubber tires.



Manufacturers of

6 to 50 ton trailers
coal pinning machines
coal crushers
pick breakers
vibratory screens
conveyors
feeders
loading booms
shaking screens

Literature on each available— send today.

WRITE FOR COMPLETE DETAILS

UNITED IRON WORKS COMPANY

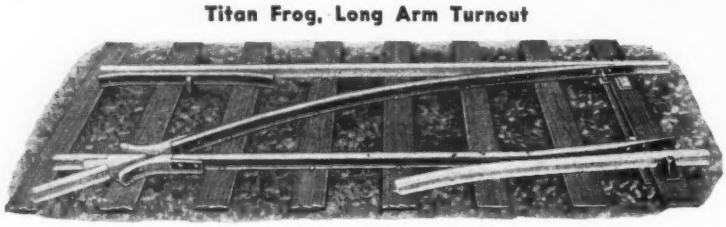
ENGINEERS • FOUNDERS • MANUFACTURERS

PITTSBURG ***Trailers, and Coal Mine Equipment*** **KANSAS**

KEEP More COAL ROLLING FASTER with DEPENDABLE FROGS and SWITCHES

WEIR KILBY

Titan Frog, Long Arm Turnout



The Titan Frog is furnished in Titanium or Manganese treated steel. In combination with the proper switches, stands, etc., it is easily installed; used right or left hand; saves joint bars.

Weir products for mine track work include a wide variety of constructions in frogs, switches, guard rails, clamps, stands, etc.

CATALOG "H" comprises 154 pages of helpful data, replete with photos, drawings and specifications, covers every track work need. A request on your letterhead will bring your copy promptly.

Suppliers to Mines and Railroads Since 1882

WEIR KILBY CORPORATION

CINCINNATI 12, O. **BIRMINGHAM 7, ALA.**

Exporters' Association Chartered

The Coal Exporters Association, affiliated with the National Coal Association and in existence for many years, serving mine operators and shippers directly concerned with export of coal, has been chartered under the laws of Delaware as a non-profit corporation. The corporate name is Coal Exporters Association of the United States. The directors, who are the same as those of the predecessor unincorporated association, will meet soon to elect officers.

•

Coal Group Resumes Stoker Promotion

With the cessation of hostilities with Japan the Bituminous Coal Utilization Committee in Kansas City lost little time in formulating plans to advertise the outstanding features of stokers. The campaign began Sept. 16 with an ad covering nearly seven columns in newspapers in Missouri, Kansas, Nebraska and Iowa urging every householder to withhold making any installation until he inspected the new stokers coming off the line. New ads were sceduled at fortnightly intervals.

The Bituminous Coal Utilization Committee includes: Arthur Stock, vice president in charge of sales, Sinclair Coal Co.; Arthur McElhenie, vice president in charge of sales, Pittsburg & Midway Coal Mining Co.; George Kline, sales engineer, Mackie Clemens Fuel Co.; W. G. Gregory, vice president, Binkley Coal Co.; W. E. Blucher, head of the Kansas City Coal Service Institute; and Murrel Crump, advertising director, Sinclair Coal Co.

•

Association Activities

Coal Producers Association of Iowa has elected the following officers: S. Harvey Blount, Central Service Co., president; M. M. Van Dike, Old King Coal Co., vice president; Arch Jones, Jones Coal Co., vice president; B. J. Powers, Dallas Fuel Co., treasurer, and M. G. Youngquist, executive secretary. Directors are M. M. Van Dike, Arch Jones, M. B. McConville, S. Harvey Blount, K. G. Carney, B. J. Powers and V. P. Smith.

•

Obituary

Burton A. Pratt, 68, president, Dakota Collieries Co., operating lignite mines in North Dakota, died Aug. 29 at his summer home at Bay Lake, Minn.

Robert M. Newcomb, labor commissioner for the Central Pennsylvania Coal Producers Association for many years, died Sept. 14 at his home in Huntingdon, Pa., following a heart attack.

W. O. Malone, 75, president of the Malone Coal Co., Philippi, W. Va., died suddenly Sept. 19 at his home. He had previously been connected with the Hutchinson Coal Co. for many years.

SAYS THE MAN IN THE HELMET—
"My first choice for any welding job is one of these swell
AIRCO ELECTRODES.
They're easy to use and they do a grand job."

THAT in brief is the reason why so many welders prefer Airco Electrodes for every welding job. For, in addition to meeting the metallurgical and mechanical requirements of each specific job, Airco Electrodes have those easy-working features that enable the welding operator to meet output schedules consistently.

After exacting laboratory trials each new Airco electrode is thoroughly pretested for working ease and efficiency by welding operators of varying skill and experience. Their suggestions, incorporated into the final product, assure an electrode that will rate high with the vast majority of operators.

* * *

SEND FOR FREE CATALOG

—which gives detailed information on Airco's complete line of shielded arc electrodes for every welding job. Address your local Airco office or Dept.——, Air Reduction, General Offices: 60 East 42nd Street, New York 17, N. Y. In Texas: Magnolia Airco Gas Products Co., General Offices: Houston 1, Texas.

AIR REDUCTION AIRCO

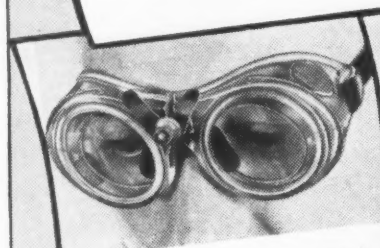
OFFICES IN PRINCIPAL CITIES

Weld with

AIRCO **ELECTRODES** FOR BETTER WELDS AND EASIER WELDING

LOW COST
Eye Safety For
Spectacle Wearers

Willson Cover-All* cup goggles give complete protection on eye-hazardous operations. Roomy enough to fit over ordinary correction spectacles.



Direct ventilation prevents lens fogging. Eye cups are transparent for clear side perception. Accurately fitted to facial contours. Leather nose bridge adds extra security.

Designed to withstand impact hazards striking from any angle. Each Super-Tough* lens is given rigid, individual testing. Uniformly heat treated to assure maximum fracture resistance.

For help with your eye-protection problems, get in touch with your Willson distributor or write for further information.

*T. M. Reg. U. S. Pat. Off.

GOGGLES • RESPIRATORS • GAS MASKS • HELMETS

WILLSON
DOUBLE
PRODUCTS INCORPORATED
Established 1870

239 WASHINGTON STREET • READING, PA., U.S.A.

Iowa Home Owners Prefer Coal Heat

A Statewide survey in Iowa shows that prospective owners of 140,000 new dwellings to be built in a postwar construction program 34 percent will employ coal-heating equipment. Gas was second choice, with 30 percent, and oil third, with 29 percent; the preference of the remaining 7 percent was not indicated. Building expense for the new homes will total about $640,000,000.

•

Preparation Facilities

West Kentucky Coal Co., East Diamond Mine, Madisonville, Ky.—Contract closed with Roberts & Schaefer Co. for complete washing plant embodying hydro-separators and Hydrotators to clean 0x6-in. coal at rate of 500 t. p. h.; following sizes to be produced: 6x3, 3x2, 2x1¼, 1¼x¾, ¾x¼, ¼x10-mesh, 10-mesh x0; to be completed Dec. 1.

Koppers Coal Division, Kopperston, W. Va.—Contract closed with Roberts & Schaefer Co. for complete experimental pilot cleaning plant including 450-ton-capacity storage bins; pilot-plant capacity 37½ t.p.h., ultimate plant capacity 155 t.p.h.; 0x⅜-in. coal will be pre-dried before cleaning in Stump Air-Flow cleaning unit at rate of 22½ t.p.h. and 10 or 14 mesh x 0 will be cleaned, about 10 to 15 t.p.h., in Ritter electrostatic cleaning units; to be completed Dec. 1.

Koppers Coal Division, Kopperston, W. Va.—Contract closed with Roberts & Schaefer Co. to remodel headhouse and lower tipple, including picking facilities and rock crushing and additional screen facilities at lower tipple, to bring capacity up to 750 t.p.h. of mine-run, with future capacity of 1,075 t.p.h. of mine-run; to be completed Dec. 1.

Windsor Power House Coal Co., Beech Bottom Mine, Wellsboro, W. Va.—Contract closed with Roberts & Schaefer Co. to remodel upper tipple with apron feeders, shaking screens, picking tables, dump coal crusher to handle 600 t.p.h. of mine-run; to be completed Dec. 1.

D. J. B. Collieries, Inc., Flannery, Ky.—Contract closed with Roberts & Schaefer Co. for complete tipple including headhouse, retarding button conveyor, screens and picking facilities for mine-run; capacity, 200 t.p.h.; to prepare nut and slack; to be completed Dec. 1.

Tuscarora Stripping Co., Randolph Colliery, Port Carbon, Pa.—Contract closed with Wilmot Engineering Co. for two 7-ft.-diameter Hydrotators to prepare barley and No. 4 sizes of anthracite; total feed capacity, 120 t.p.h.

Steam Coals, Inc., Shamokin, Pa.—Contract closed with Wilmot Engineering Co. for Type D Simplex jig to prepare chestnut coal; feed capacity, 20 t.p.h.

Elk Lick Coal Co., Gauley No. 2 Mine, Jerryville, Webster Co., W. Va.—Contract closed with Fairmont Machinery Co. for mine-run coal-handling system including electric hoist to control mine-car trip into Nolan rotary dump that dumps mine-run into a 30-ton-capacity bin; coal is fed from this bin by a reciprocating feeder at rate of 300 t.p.h. to an 1,100-ft. belt conveyor that delivers it to a Chance washing plant previously installed; equipment to be supported on steel structure; to be completed April 1, 1946.

Jefferson Coal Co., Fernwood, Ohio—Contract closed with Jeffrey Mfg. Co. for construction of tipple with raw-coal feed capacity of 400 t.p.h. of mine-run.

Gay Mining Co., Ben Creek Mine, Timbar, Mingo County, W. Va.—Contract closed with Fairmont Machinery Co. for Chance washing plant, to which 0x7-in. raw coal will be delivered at rate of 185 t.p.h. and will be screened by Allis-Chalmers vibrating screens into 7x¾ in. and 0x¾ in.; 7x¾-in. size will be cleaned in Chance cone and 0x¾ will be loaded raw or remixed with other sizes from dewatering screens; addition to existing plant; to be in operation May 1, 1946.

Oak Ridge Coal Corp., Raven Run Breaker, Raven Run, Pa.—Contract closed with Menzies Separator Co. for two 8-ft. Menzies cones, one to clean buckwheat coal and the other to clean rice; feed capacity of each, 70 t.p.h.

Paramount Coal Co., Paramount Breaker, Archbald, Pa.—Contract closed with Menzies Separator Co. for one 6-ft. Menzies cone to clean stove and nut coal; feed capacity, 40 t.p.h.

Steam Coals, Inc., Shamokin, Pa.—Contract closed with Deister Concentrator Co. for three SuperDuty Diagonal-Deck washing tables; two to clean pea and one to clean barley coal.

Northwestern Improvement Co., Roslyn, Wash.—Contract closed with Deister Concentrator Co. for three SuperDuty Diagonal-Deck No. 7 washing tables to handle 0x3/16-in. bituminous coal; also one 6-way split Concenco revolving feed distributor.

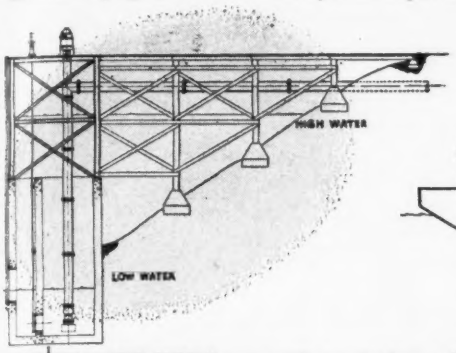
•

Coal Publications

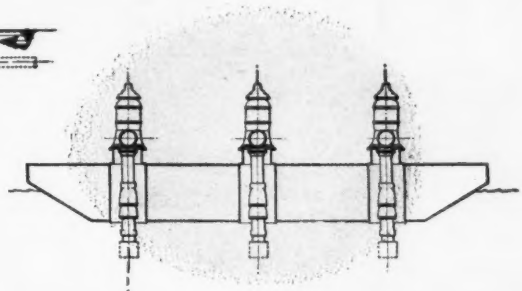
Coal-Mine Explosions and Coal- and Metal-Mine Fires in the United States During the Fiscal Year Ended June 30, 1944, by D. Harrington and W. J. Fene, U. S. Bureau of Mines. I. C. 7330; 36 pp., 8x10½ in.; paper; mimeograph; free. From 1929 to 1944, no less than 44.7 percent of all mine explosions were of electrical origin; 33.4 percent were ascribed to open lights and smoking, 14.1 percent to explosives, with 7.8 percent due to unknown or miscellaneous causes. Open-light mines had 33.7 percent of the explosions; closed-light mines, 59.5 percent, and 6.8 percent occurred in mines with unrecorded lighting. The greater gas hazards existing in the mines that have closed lights, carelessness in regard to smoking and use of unsafe mechanical equipment in such hazardous mines are reasons ascribed for the greater number of explosions in closed-light operations, no instance of an explosion caused by an electric safety lamp being of record. In the circular, methods for decreasing explosion and fire hazards are suggested.

Destruction of Damaged, Deteriorated or Unwanted Commercial Explosives, by R. D. Leitch and P. R. Moyer, U. S. Bureau of Mines. I. C. 7335; 6 pp., 8x10½

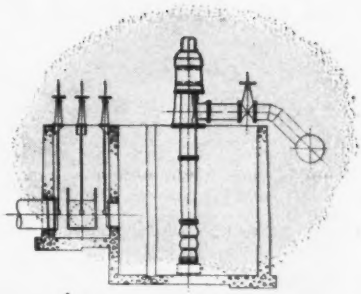
Another page from the widespread experience of Fairbanks-Morse pump engineers!



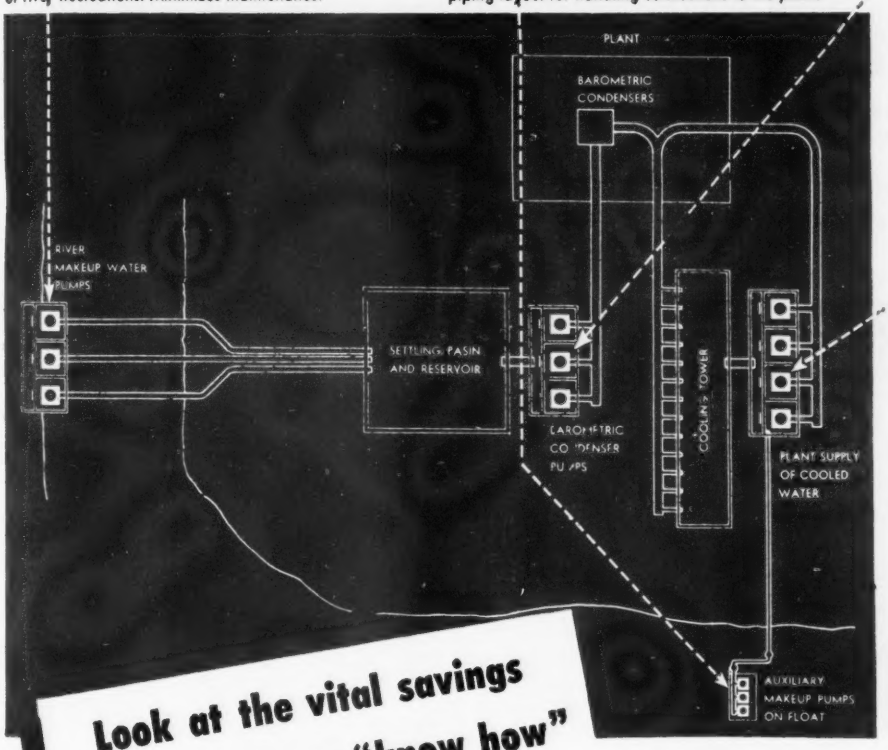
PRIMARY WATER SUPPLY pumps pick up water from low point in river where water is coolest. For same quality water, horizontal pumps would require sinking of caissons—impractical and extremely costly. Besides money-saving simplicity of F-M Pomona installation, note added advantage that pumps are below water level—always primed—and motors are above water level—always safe—regardless of river fluctuations. Minimizes maintenance!

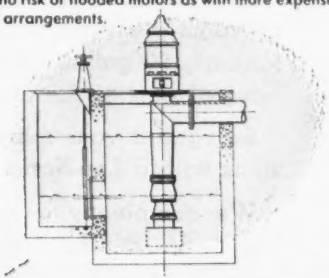


AUXILIARY WATER SUPPLY is provided by six small capacity Fairbanks-Morse Pomona Turbine Pumps mounted on floats in the river. Here, besides installation simplicity and the no-priming, protected-motor advantages outlined at left, the unusual compactness of Fairbanks-Morse Turbine Pumps made possible important savings in barge size with ample floor space between the pumps, and a very simple piping layout for handling connections to the plant.

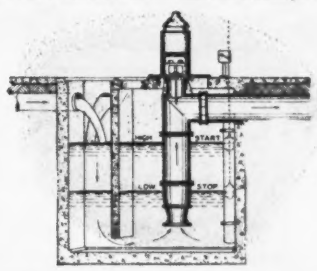


CONDENSER PUMPS are Fairbanks-Morse Mix-Flow type, giving high volume at relatively low lift. Note simplicity of installation with no costly "dry well" necessary. Also note clean, uncluttered floor space around pumps with all flow connections underground and motor heads readily accessible for servicing. No climbing into pits, no priming problems, no risk of flooded motors as with more expensive "dry well" arrangements.





PLANT SUPPLY pumping installation of the 5000 GPM units is also unusually simple, compact and inexpensive. Here again—no costly dry wells, no priming or motor-flooding problems, no complicated maintenance requirements . . . all features that save time and money!



IN ADDITION to the above pumping applications, Fairbanks-Morse Vertical Pumps also handle the drainage pumping for this plant. Two F-M Niagaras handle 20,000 GPM at 12 foot head. Though the water is sand-laden these pumps handle it in large volumes without difficulty.

Look at the vital savings Fairbanks-Morse "know how" made at this plant!

FOR a quick picture of the *multiple* savings you can make with a Fairbanks-Morse Vertical Turbine Pump installation, check over this industrial layout. It was made by Fairbanks-Morse Pomona engineers for a chemical process plant—one of the largest and most modern of its kind in the nation.

In addition to these savings which are typical of Fairbanks-Morse experienced pump engineering, note also the unusual versatility of Fairbanks-Morse Turbine Pumps. From primary water supply, through condenser pumping, plant pumping, and drainage—F-M Vertical Pumps handle each type of job with important installation, operation and maintenance savings!

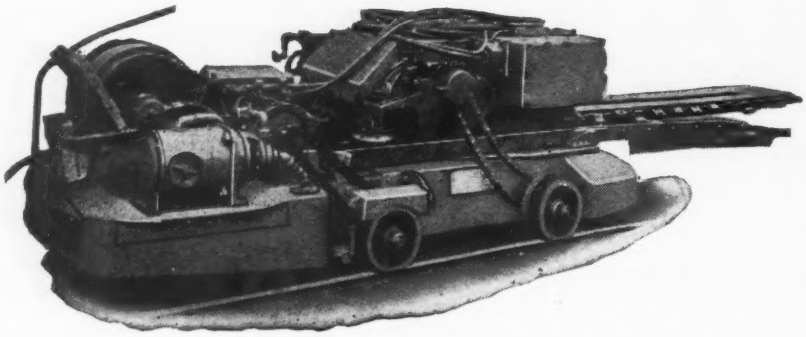
No matter what *your* pumping application, Fairbanks-Morse experienced pump engineering is ready to help you cut installation costs, reduce operating costs and simplify pump maintenance. A call or letter to your nearby distributor places this extensive pump knowledge at your service without obligation. Fairbanks, Morse & Co., Chicago 5, Illinois.

Write for Bulletin HQ-105

POMONA PUMPS
another product of
Fairbanks-Morse
A name worth remembering

Diesel Locomotives • Diesel Engines • Generators • Motors • Pumps • Scales
Magnetos • Stokers • Railroad Motor Cars and Standpipes • Farm Equipment

Lee-Norse TANK TRUCKS



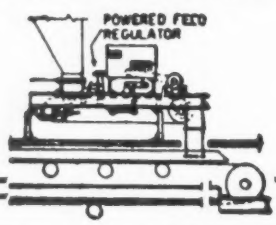
• This unit provides water spraying of the cutter chain—prevents dust and danger of explosion in workings. The tank of 180 gallon capacity is built into and becomes an integral part of the mining machine truck.

Safeguard your mine against the hazard of dust explosions with a Lee-Norse Tank Truck.

We completely overhaul and factory rebuild various kinds of mining machinery—cutters—loaders. Phone us—Charleroi 750.

Lee-Norse Company
CHARLEROI, PA.

MERRICK



FEEDOWEIGHT

Accurately Feeds and Records by Weight

Look into this method of feeding coal to a mixing conveyor.

A powered feed regulator controls the feed gate. A visible balance indicator shows true balance for correct rate of feed, while the weight totalizer keeps an accurate record of the day's tonnage.

Investigate this sturdy, dependable equipment for controlling and recording by weight.

Write for Bulletin 551.

Merrick Scale Mfg. Co.
Passaic, N. J.

in.; paper; mimeograph; free. Unwanted black powder is best destroyed by dumping it into a stream or large body of water, unless this would contaminate potable water, but it also may be burned.

Procedure Handbook of Arc-Welding Design and Practice, 8th Edition, by Lincoln Electric Co. 1282 pp., 5¾ x 8⅛ in.; synthetic leather. Price, $1.50 in U. S. A.; $2 elsewhere. Covers electric welding in all its phases.

•

Mine Fatality Rate Shows Slight Upturn

Accidents at coal mines of the United States caused the deaths of 68 bituminous and 9 anthracite miners in July last, according to reports furnished the U. S. Bureau of Mines by State mine inspectors.

With a production of 47,460,000 net tons, the accident death rate among bituminous miners in July last was 1.43 per million tons, compared with 1.20 in the preceding month and 3.51 in July, 1944.

The anthracite fatality rate from accidents in July last was 1.83, based on an output of 4,980,000 tons, against 2.48 in the preceding month and 2.45 in the seventh month a year earlier.

For the two industries combined, the accident fatality rate in July last was 1.47, compared with 1.33 in the preceding month and 3.41 in July, 1944.

Fatalities during July last, by causes and States, as well as comparable rates for the first seven months of 1944 and 1945, were

U. S. COAL-MINE FATALITIES IN JULY, 1945, BY CAUSES AND STATES

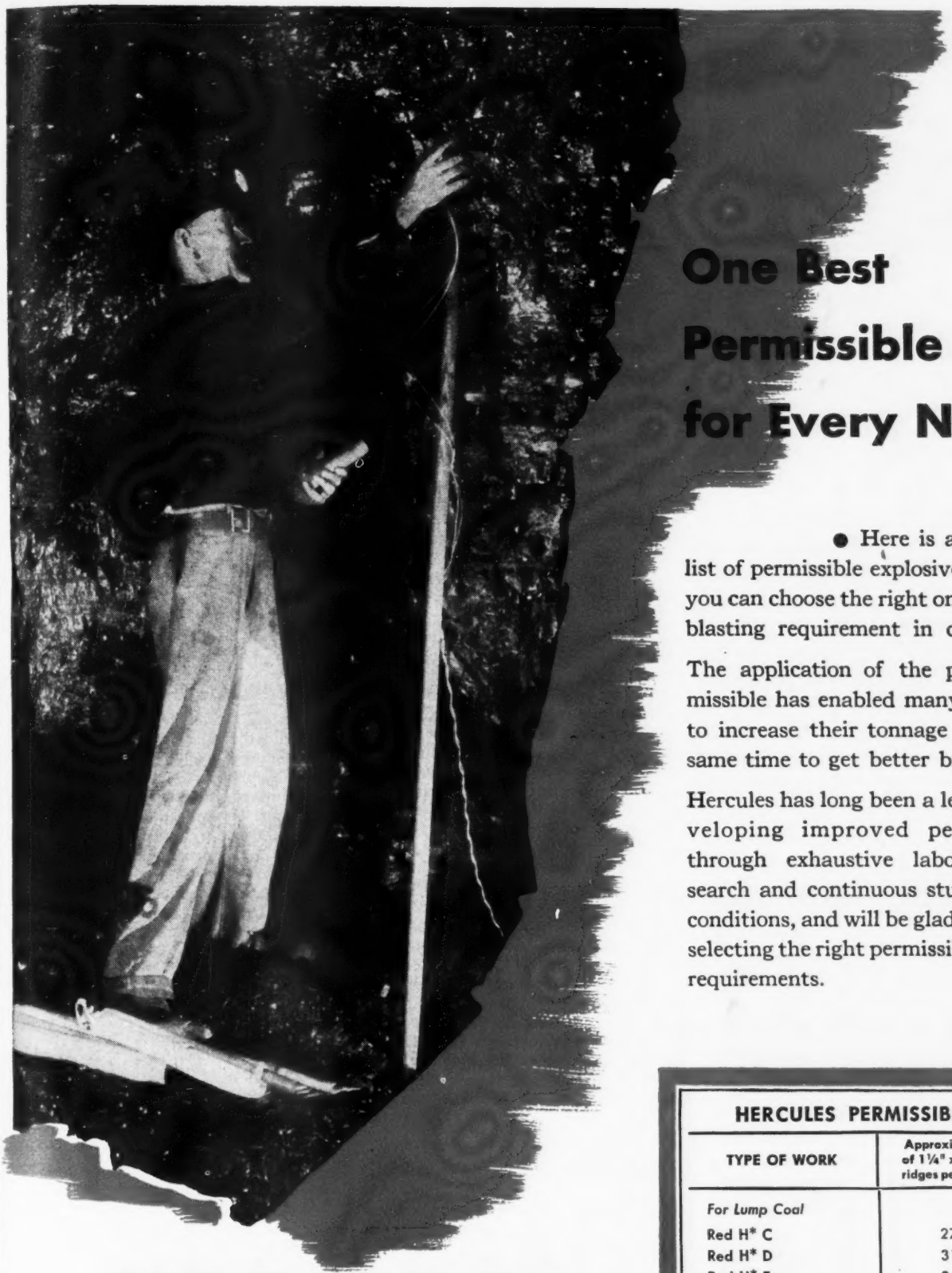
State	Underground: Falls of Roof	Falls of Face	Haulage	Explosives	Electricity	Machinery	Other Causes	Total Underground	Open-cut	Surface	Grand Total
Alabama	1	..	..	..	1	1	..	3	..	1	4
Colorado	1	..	..	..	..	1	..	2	..	..	2
Illinois	2	..	..	..	..	..	..	2	..	..	2
Kansas	..	..	..	..	..	..	..	..	1	..	1
Kentucky	2	..	3	..	..	1	..	6	..	..	6
Ohio	1	..	3	..	..	..	..	4	..	1	5
Oklahoma	..	..	..	..	1	..	..	1	..	..	1
Penna. (bituminous)	7	1	7	..	1	..	..	16	..	1	17
Tennessee	2	..	..	1	..	..	..	3	..	..	3
Virginia	..	..	..	..	..	..	1	1	..	..	1
Washington	2	..	..	..	..	..	..	2	..	..	2
West Virginia	13	..	7	..	2	1	..	23	..	1	24
Total bituminous	31	1	20	1	5	4	1	63	1	4	68
Penna. (anthracite)	5	..	1	2	1	..	..	9	..	..	9
Grand total	36	1	21	3	6	4	1	72	1	4	77

DEATHS AND FATALITY RATES AT U. S. COAL MINES, BY CAUSES OF ACCIDENTS*

January-July, 1944 and 1945

Cause	Bituminous: Number Killed		Killed per Million Tons		Anthracite: Number Killed		Killed per Million Tons		Total: Number Killed		Killed per Million Tons	
	1944	1945	1944	1945	1944	1945	1944	1945	1944	1945	1944	1945
Underground:												
Falls of roof and coal	351	236	0.957	0.686	49	34	1.290	1.069	400	270	0.988	0.719
Haulage	131	123	.357	.358	15	15	.395	.472	146	138	.361	.367
Gas or dust explosions:												
Local	6	9	.016	.026	1	1	.026	.031	7	10	.017	.027
Major	22	39	.060	.113	...	...	....	....	22	39	.054	.104
Explosives	9	14	.025	.041	10	6	.263	.189	19	20	.047	.053
Electricity	21	16	.057	.046	2	1	.053	.031	23	17	.057	.045
Machinery	20	27	.054	.078	...	2	....	.063	20	29	.049	.077
Shaft	4	5	.011	.015	4	1	.105	.032	8	6	.020	.016
Miscellaneous	88	5	.240	.015	10	7	.263	.220	98	12	.242	.032
Stripping or open-cut	16	15	.044	.044	5	2	.132	.063	21	17	.052	.045
Surface	31	32	.085	.093	7	6	.184	.188	38	38	.094	.101
Total	699	521	1.906	1.515	103	75	2.711	2.358	802	596	1.981	1.586

* All figures subject to revision.



One Best Permissible for Every Need

● Here is a simplified list of permissible explosives. From it you can choose the right one for every blasting requirement in coal mines.

The application of the proper permissible has enabled many operators to increase their tonnage and at the same time to get better breakage.

Hercules has long been a leader in developing improved permissibles, through exhaustive laboratory research and continuous study of field conditions, and will be glad to assist in selecting the right permissible for your requirements.

HERCULES PERMISSIBLES

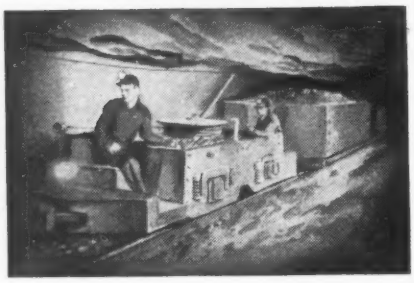
TYPE OF WORK	Approximate No. of 1¼" x 8" Cartridges per 100 lbs.
For Lump Coal	
Red H* C	276
Red H* D	316
Red H* F	356
For Rock or Fine Coal	
Red H* B	280
Collier* C	320
For Wet Work	
Hercogel* A	200
Hercogel* 2	240

HERCULES

EXPLOSIVES DEPARTMENT
HERCULES POWDER COMPANY
INCORPORATED
936 KING STREET
WILMINGTON 99, DELAWARE

*Reg. U. S. Pat. Off. by Hercules Powder Company

XP-51



Equipment News

Oil Circuit Breakers

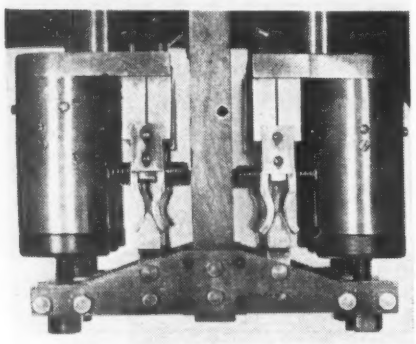
On-the-line tests in a special research laboratory prove under actual service conditions the value of the "Exotherm" principle of arc extinction now used in 7.5- and 15-kv. 600- and 1,200-amp. breakers in its line, states the Roller-Smith Co. (Division of Realty & Industrial Corp.), Bethlehem, Pa.

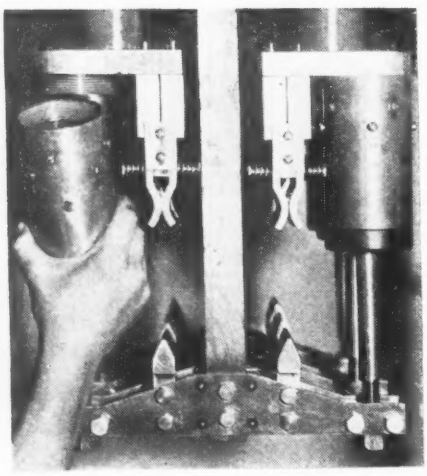
The laboratory, located adjacent to the Pennsylvania Power & Light Co.'s Siegfried substation, can use up to 250,000 kva. of the substation's 1,250,000 kva. for intervals short enough to prevent instability to the power system. This on-the-line method of testing, carried on near such a large concentration of power, imposes the most exacting service conditions with respect to: sustained voltage during the short; normal frequency recovery voltage; transient recovery voltage; decrement; and stored electrostatic and magnetic energy.

These on-the-line tests have helped to demonstrate the value of the arc quenchers, employing the "Exotherm" principle of arc extinction, now built into the 7.5- and 15-kv. 600- and 1,200-amp. sizes of Roller-Smith oil circuit breakers. This principle of arc extinction recognizes the fact that as the temperature of a gas is increased its conductivity is increased, but not in a linear fashion. It recognizes also that as the pressure of a gas is increased, its conductivity decreases. Any arrangement whereby the heat of the arc can be extracted tends to make the arc medium non-conducting, and thereby quenches the arc.

In the arc quenching devices, now standard on the 7.5- and 15-kv. breakers, the cooling of the arc is accomplished by bringing the arc intimately in contact with the oil; at current zero it is intended to have these hot gases so arranged that a maximum of heat will leave them, thus raising the dielectric strength to a point where the arc is quenched as the current passes through zero. At the same time, the high pressure in the quencher assists in the process.

The gases generated in the inclosure upon expanding through the body of the oil in the tank are effectively cooled and condensed. This relieves the internal tank pressures to a very nominal value. Since this volume is reduced, less space is required between live parts of the breaker, internally. Moreover, the pressure further assists in accelerating the moving parts of the breaker. It increases the speed of opening, or decreases the length of time the arc is in existence, thereby decreasing the burning away of the arcing contacts.



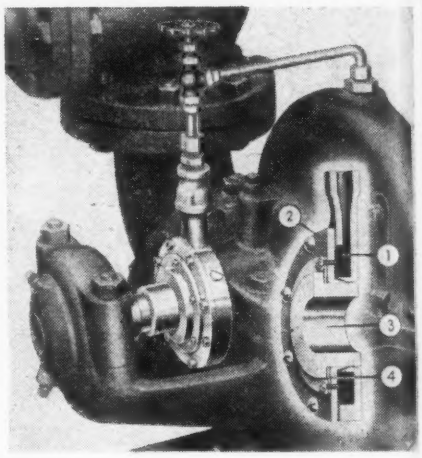


•

Shaft Seals

Heat-resistant and non-corrosive seals for horizontal centrifugal pumping units offered by Jet Shaft Seals, Inc., 1452 South San Pedro St., Los Angeles 15, Calif., are stated by the manufacturer to save a large percentage of pump maintenance costs by eliminating waste of fluid, packing expense and the cause of sleeve and shaft wear; to provide greater continuity of pump service and, by ending packing drag, reduce power input.

In principle the seal draws pressure from the high point and directs it back into the low-pressure area of the pump with sufficient force to seal of internal pressures. The liquid flows through (1) the liquid box inward past (2) the orifice plate and back into the pump. Shaft sleeve (3) turns with the shaft, but is not in contact with the orifice plate, so there is no point of wear.

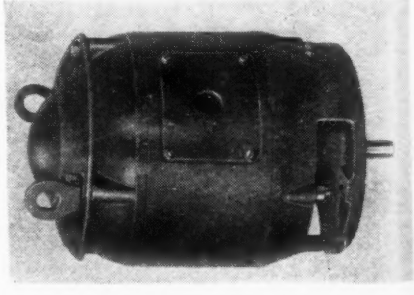


The diaphragm (4) provides a leakproof seal while the pump is not in operation, being pressed outward, by the pressure within the pump, against the shoulder of the shaft sleeve. There is no contact while the pump is turning; only momentarily when the pump actually is starting or stopping. Seals are available in both bronze and stainless steel.

•

Vertical Motor

Crocker-Wheeler Division of Joshua Hendy Iron Works, Ampere, N. J., offers a new addition to its line of protected-type a.c. motors. The newcomer, a vertical drip-proof motor rated at 40 deg. C. rise continuous duty with a 15 percent service factor, is designed for operation from 60- or 50-cycle 3- or 2-phase circuits at all standard voltages. At present a N.E.M.A. "B" flange type mounting up to and including the 284 frame and a N.E.M.A. "C" face-type mounting up to and including the 326 frame are available.



J&L PERMASET PRECISIONBILT PRE-FORMED WIRE ROPE

J&L
PERMASET PRE-FORMED
WIRE
LINES

Precisionbilt to suit the job — stay on the job. Shaft ropes . . . feed ropes . . . conveyor ropes . . . drag lines — right through the catalog of wire rope for mining — you will find the J&L rope to suit the job and stay on it. For J&L Wire Rope is Precisionbilt from J&L Controlled Quality Steel . . . by men of skill and experience . . . on machines of extreme accuracy. For extra service . . . extra long life . . . J&L Permaset Pre-formed pays extra dividends on your equipment investment.

J&L STEEL

JONES & LAUGHLIN STEEL CORPORATION

GILMORE WIRE ROPE DIVISION

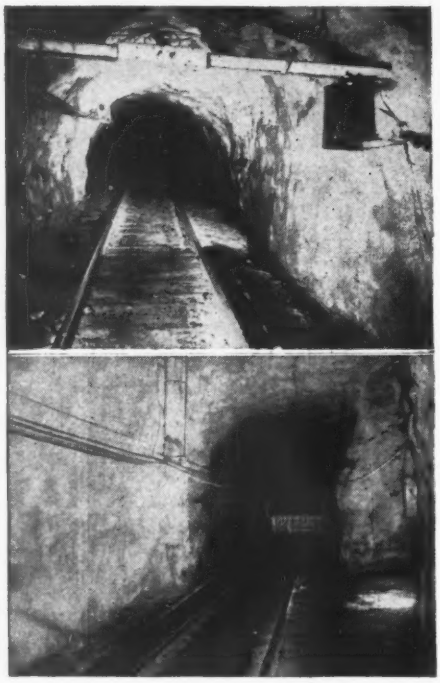
PITTSBURGH 30, AND MUNCY, PENNSYLVANIA

J&L PERMASET PRECISIONBILT PRE-FORMED WIRE ROPE

CEMENT GUN COMPANY

"GUNITE" CONTRACTORS

GENERAL OFFICES—ALLENTOWN, PENNA., U.S.A.



LOWER MAINTENANCE COSTS WITH "GUNITE"

Modern coal mines have used "GUNITE" for many years for lining the sides and roofs of haulageways, slopes, entries and underground rooms with resulting big savings in maintenance costs.

Summed up briefly, "GUNITE" offers the following:

1. Elimination of roof fall hazards, and attendant cleaning up.
2. Elimination of a great deal of timbering.
3. Additional head room, and better visibility due to the light colored "GUNITE" surface.
4. Clean entries and passageways.
5. Better ventilation due to greater unobstructed area.
6. Surface of "GUNITE" retains rock dust readily.
7. Lower mine maintenance costs.

We sell the equipment or we do the work by contract. Write today for your free copy of our new Bulletin D-2300.

MANUFACTURERS OF THE CEMENT GUN

FLEXIPIPE

The improved flexible tubing for mine and tunnel ventilation

This flexible air tubing is ready for immediate, easy installation. On account of its flexibility, it can be put up or taken down in a fractional part of the time required by a more rigid means of face ventilation.

Write for free sample and full information.

BEMIS BRO. BAG CO.

412 Poplar Street, St. Louis 2, Mo.

MORE HAULAGE FOR 20% LESS BATTERY CAPACITY

Oil-tight, non-leak transmission. Use regular auto oil; change every 6 months.

Strong, Simple, Low maintenance cost.

Extra-long journal springs assure better trackability.

Large motor, to assure more horsepower per ton weight of locomotive.

Can be equipped with hydraulic brake.

GREENSBURG "RANGER"

This locomotive being used for main line haulage at the Blacksmith Coal Company, Novinger, Missouri. This is a 4½ ton locomotive, operating on 30" gauge track. This locomotive built from 3½ to 10 tons – either single or double motor drive – 16" to 56½" track gauge. Also factory rebuilt storage battery locomotives with new locomotive guarantee.

All Greensburg Locomotives are* CUSTOM-BUILT *to your requirements

THE GREENSBURG MACHINE CO. 101 STANTON ST. GREENSBURG, PA.

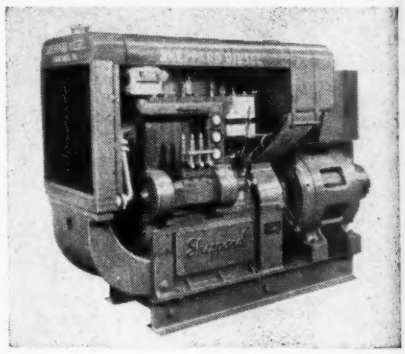
All ventilating openings of the new motors are shielded against the entrance of dripping liquids and falling particles. Oversize ball bearings are provided to carry thrust in addition to the rotor, and the use of the company's patented centrifugal bearing seal permits the use of softer grease for better lubrication and longer bearing life.

A new recessed junction box, which provides ample room for making electrical connections, is employed in the motor's design. The Alucast rotor, with bars, fans and end rings cast in one operation from aluminum alloys, is used. Other features include heavy cast frame construction and coils protected with Vinylastic insulation.

•

Load Control

Development of completely automatic load control of diesel-powered generating sets by engineers of the R. H. Sheppard Co., Hanover, Pa., cuts operating time of the power plant, it is said, to periods when power is actually required, reducing fuel consumption and prolonging the life of the equipment—the load demand on the power circuit controls the starting and stopping of the power source.

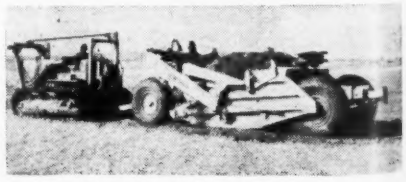


The flick of any lighting or appliance switch on an electrical circuit supplied by a diesel-powered generating set equipped with load control, say R.H.S. engineers, will automatically start the generator; power is instantly available. Turn off the switch and the power plant immediately stops. Load control requires no special wiring; simply connect to existing service leads. Available for single or 3-phase generators.

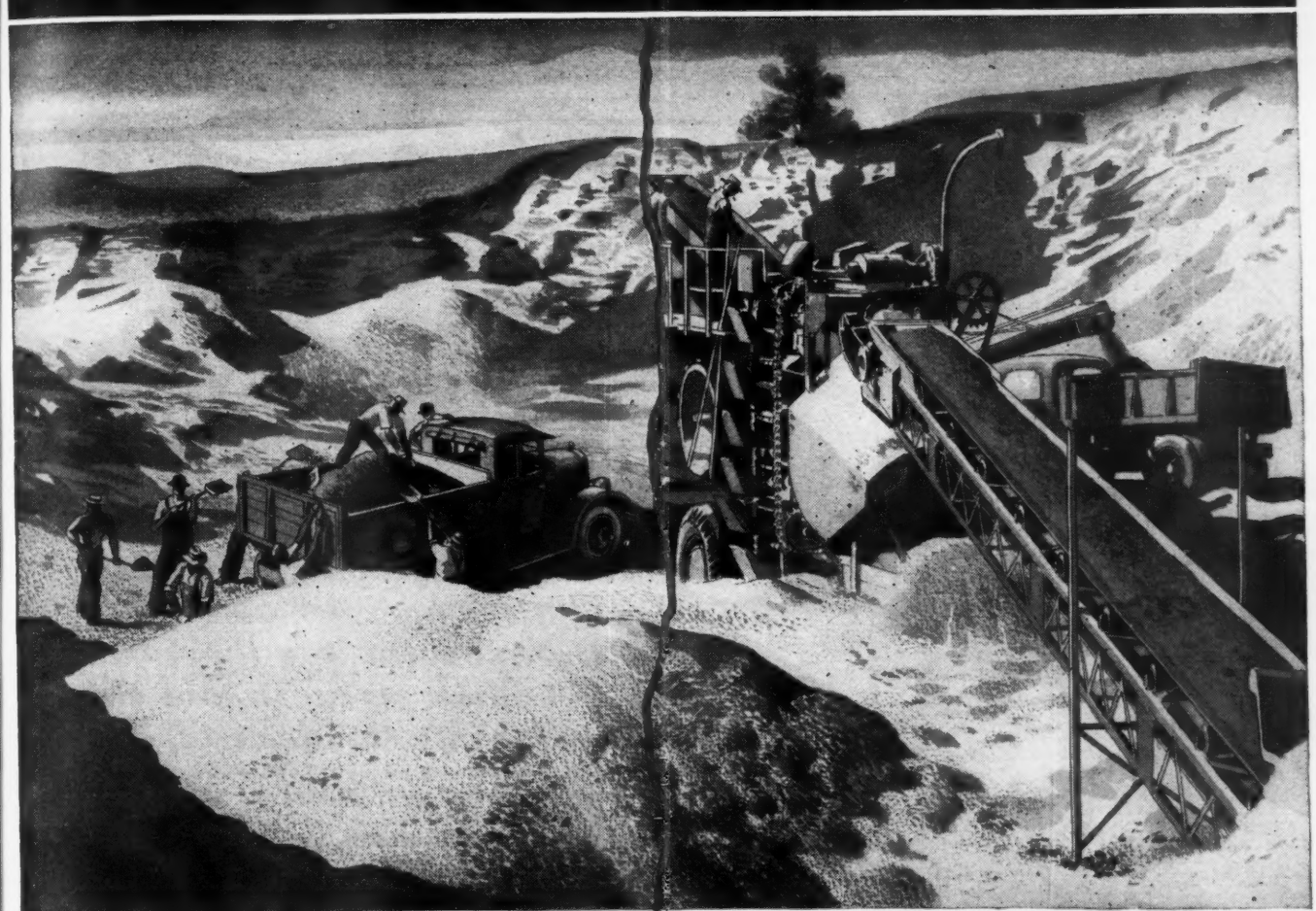
•

Scrapers

A new 8½-yd. scraper (11 cu. yd. heaped) incorporating new design features is offered by the LaPlant-Choate Mfg. Co., Inc., Cedar Rapids, Iowa. A new feature of this new model (C-108) is a floating apron that opens 30 in. before the rear gate moves, permitting adjustment of the apron to any position before loading.



Thermoid —Key to Progress in Many American Industries



LOADING OPERATION BEFORE THE USE OF CONVEYOR BELTING

MODERN LOADING OPERATION USING THERMOID CONVEYOR BELTING

SINCE 1880, Thermoid has contributed to the progress of American Industry. Through three wars, and the intervening periods of peace, Thermoid engineering, research and manufacturing facilities have been devoted to the improved design and production of Industrial Rubber Products. Thermoid stands today in a position, unsurpassed by any competitor, to contribute to the post-war progress of your industry. The Thermoid Line* of belting and hose for materials handling and power transmission may contain the key to another step forward in the improvement of your process and the reduction of your costs. When you call in the Thermoid representative you'll agree with many other manufacturers that—"It's Good Business to Do Business With Thermoid."

***THE THERMOID LINE INCLUDES: Transmission Belting • F.H.P. and Multiple V-Belts and Drives • Conveyor Belting • Elevator Belting • Wrapped and Molded Hose • Sheet Packings • Industrial Brake Linings and Friction Products • Molded Hard Rubber and Plastic Products.**

Thermoid Rubber

DIVISION OF THERMOID COMPANY

TRENTON, NEW JERSEY

Contributor to Industrial Advancement Since 1880

"HERCULES" (Red-Strand) Wire Rope

Hercules of mythology has lived through the ages because of his ability to do the big jobs. His super-human strength and endurance made this possible—

"HERCULES" (Red-Strand) Wire Rope is also a "doer." Its qualifications, too, are the same. It not only has the strength to handle the big loads, but—and this is of *great* importance in wire rope usage—it also has the stamina and endurance to stand up under bending stresses and other gruelling conditions encountered in present day work.

For *consistent* top-flight performance you can rely on this modern "HERCULES". It is available in both Round Strand and Flattened Strand constructions, in either the Preformed or Non-Preformed type.

MADE ONLY BY

A. LESCHEN & SONS ROPE CO.

WIRE ROPE MAKERS — ESTABLISHED 1857

5909 KENNERLY AVENUE — ST. LOUIS, MISSOURI, U. S. A.

NEW YORK . . . 90 West Street
CHICAGO . . 810 W. Washington Blvd.
DENVER . . . 1554 Wazee Street

SAN FRANCISCO . . 520 Fourth Street
PORTLAND . . 914 N. W. 14th Avenue
SEATTLE . . 3410 First Avenue South

PROTECTION

when and where

NEEDED MOST

Each Hodgman garment is designed for a specific use or occupation to stand up under the most severe service conditions. All fabrics, coated in our own plant, meet the most rigid government specifications. All Hodgman garments are reinforced in the proper places, are waterproof and provide the utmost in comfort. There is a Hodgman garment for almost every industrial use.

PROTECTIVE CLOTHING

Address Dept. C-1 — *for latest Catalogue*

HODGMAN RUBBER CO.

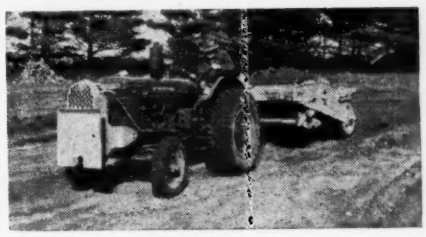
Framingham, Mass.

New York 6, 261 Fifth Ave. — Chicago 2, 173 W. Madison — San Francisco 5, 121 Second

Also the apron clears the load completely as the rear gate starts to move forward, thus prevening any compaction of load between gate and apron.

The open bowl, free of overhead obstructions, permits loading by shovel, dragline or elevating grader, and the high lift of the apron enables the scraper to discharge any type of material from the bowl. The scraper is the front-dumping forced-ejection type, designed to facilitate spreading.

Another postwar equipment unit is a 2-yd. front-dump scraper, Model CW-2, weighing only 2,550 lb. When fully loaded, weight is lifted from the tractor's front wheels and much of the weight of the load is centered on the driving wheels.



Bowl and apron are operated hydraulically. Operating features include ability to make cuts up to 11½ in. and to produce smooth finished work. It can be loaded in all scraper material without the aid of a pusher or loaded from overhead, as there are no overhead structures to interfere.

•

Band-Saw Guide

A band-saw guide and metal safety guide especially adapted to metal and plastics as well as wood and adjustable to blades ¼ to 1½ in. wide is offered by the safety division of the Boyer-Campbell Co., 6540 St. Antoine St., Detroit 2, Mich. Side guide wheels mounted in a staggered position to eliminate binding, and a grooved back wheel to hold saw in position, all equipped with double-sealed permanently lubricated ball bearings, are said to give a smoothness of operation that produces a clean, accurate cut, reducing breakage to a minimum.

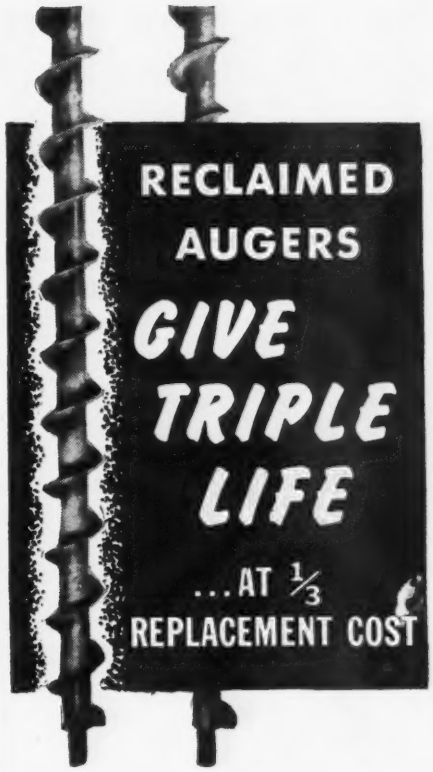
Positive adjustment of mounting arm on supporting bracket is provided by a setscrew that exerts pressure against a 90-deg. pin that in turn presses against the adjusting screw. A special 10-in. socket wrench is provided for the setscrew and adjusting screw to move the grooved wheel in and out for various width saws. Minor adjustments may be made with a No. 4 wrench while the saw is running.

•

Diamond Core Bits

A new line of diamond bits for drilling cores in many different materials is offered by the Sullivan Machinery Co., Michigan City, Ind. Manufactured under the trade name "Sul-Set," these bits are designed for use with core drills in drilling coal seams and many other purposes.

Sul-Set bits are said to have an exclusive patented design whereby the cutting



In strip mining, there is rapid wear on horizontal blast hole augers. Six-footers each, they're chewed down on the flights, becoming unfit for further service after ½ in. wear.

Instead of scrapping augers at that point, one firm coats them with Coast Metals Hard-Facing. For $15.00 (labor and materials) they get a reclaimed auger that drills 3 to 5 times more holes than a new one. And with new augers costing $53.00 each, there's a $37.00 saving into the bargain on each coated unit.

Surfaces, edges, points of new or old equipment—these are the spots where Coast Metals Hard-Facing packs extra-wear-resistance. On all ferrous metals. Welded with electric arc or acetylene torch. Write for pamphlet, "Your Best Protection Against Wear."

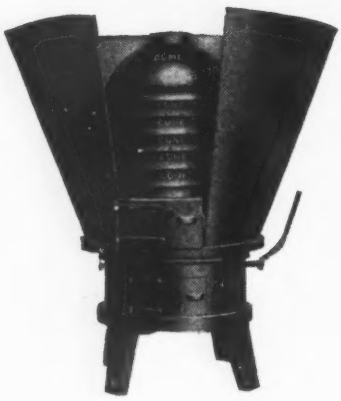
COAST METALS, INC.
Plant and General Offices:
1232 Camden Ave., S.W. Canton 6, Ohio
Executive Offices:
2 West 45th Street, New York 19, N. Y.

COAST METALS

hard-facing weld rods

MAKE YOUR EQUIPMENT LAST LONGER

DRY SAND will help you haul more coal per trip!



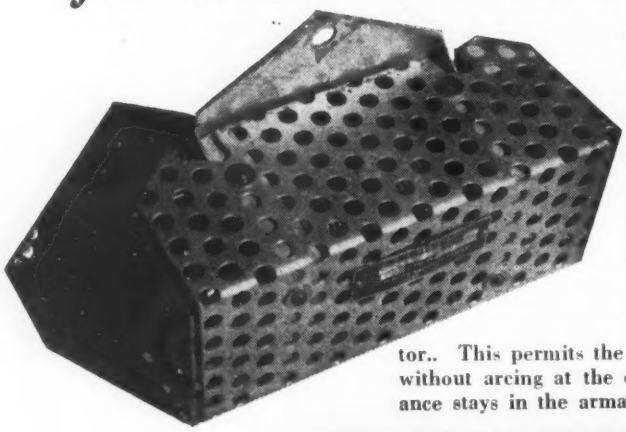
Heavy loads call for *sand*—really dry sand—running freely from locomotive to track in order that driving wheels may find traction and develop pulling power.

You can depend on having plenty of dry sand, at HALF the usual cost when you use the "PERFECTION" Cone Stove Sand Drier. The standard size dries 8 to 10 tons in 8 hours—and we can increase the size of the same drier up to 12 to 14 tons capacity. Let one of these units prove itself in your operations.

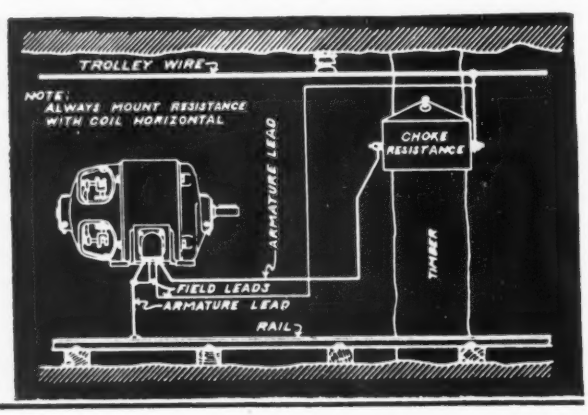
Write today for complete information on this and other Princeton products. Our facilities include Pattern Shop, Machine Shop, Grey Iron and Bronze Foundries for the manufacture of a wide variety of mining parts and accessories.

Princeton FOUNDRY & SUPPLY CO.
Princeton, West Virginia

G.M.C. CHOKE STARTER
for direct current motors



G.M.C. Choke Starters consist of a resistance coil, which connects in series with the motor armature. Resistance offered is sufficient to choke back the initial inrush of current when the motor is connected directly across the line . . . or when a circuit breaker has been out and recloses on the motor.. This permits the motor to start smoothly without arcing at the commutator. The resistance stays in the armature circuit at all times, thus eliminating the need for an automatic switch of any kind. The starter requires no operator.



Write to GUYAN today . . . we'll be glad to send complete details.

GUYAN MACHINERY CO.
LOGAN, W. VA.

face consists of a special alloy matrix molded with a series of ridges into which small diamonds are sintered. The valleys between the ridges serve as waterways designed to reduce resistance to the flow of water through the bit and around the cutting surfaces. It is pointed out that the reduced resistance to flow of water circulating through the bit insures adequate cooling, which protects the diamonds from heat damage and lengthens bit life.

Four sizes of bits are available. In addition a Sul-Set reaming shell for reaming the hole to a larger size just behind the bit and a special Sul-Set bit for drilling coal formations are available. Bulletin D-33, describing the Sul-Set bit, is obtainable from the manufacturer.

•

Anti-Fog Preparation

A new anti-fog preparation for keeping goggle lenses, face shields and welding plates clear is offered by the American Optical Co., Southbridge, Mass. Pointing out that fog on lenses, besides being annoying, is dangerous through increasing accident frequency, its maker says the new anti-fog material penetrates the ultramicroscopic pores of glass and deposits a thin film that helps prevent fogging, steaming and frosting of all types of glass surfaces. It also is said to remove grease and dirt from glass. Simply spread on both surfaces of glass, rub thoroughly and then polish with soft cloth or paper.

•

Slings

Hercules Sling Co., Rockford, Ill., has introduced a complete line of Saf-T-Lift automatically equalizing chain slings made in 4-, 7-, 14-, 25- and 40-ton capacities. Recent tests of the 7-ton model showed the newly developed chain sling to have a safety factor of 4¼ times the design load.

In operation the block or chain equalizer unit is placed on the crane hook and the crane operator spots the hook over the approximate center of gravity of the load. Floormen then attach the sling's chain legs to the load. Power to lift the load is applied by the crane operator, and as the crane hook rises the sling's chain automatically adjusts itself through the Saf-T-Lift equalizing unit. The unit consists of a steel block and a floating sheave specially constructed to fit the steel alloy chain.

•

Industrial Notes

LINCOLN ELECTRIC CO. has opened a factory branch sales office at 4427 Manchester Ave., St. Louis, under direction of B. J. Brugge.

ALLEGHENY LUDLUM STEEL CORP. plans to launch a $5,000,000 postwar research and production expansion program. An ultra-modern research laboratory and related experimental and pilot plant equipment will be built at company headquarters, Brackenridge, Pa., to intensify studies of the structure, melting, processing

A Tocco induction heat-treating m chine for hardening track shoe pins in the Oliver "Cletrac" plant.

It's our "treat"

On a crawler tractor, the track shoe pins are subjected to destructive abrasion shocks and strains. To resist these . . . to assure longer pin life, Oliver "Cletrac" tractors have hardened pins . . . electrically heat-treated to an exact depth by the most modern methods.

This *extra* quality is characteristic of every Oliver "Cletrac" tractor part . . . a basic feature of every manufacturing operation.

Quality is fundamental to every production step in the modern Oliver "Cletrac" plant . . . in materials, workmanship, and equipment.

Maintenance of that standard enables your Oliver "Cletrac" dealer to offer you the finest in crawler tractors . . . for your every need.

CLETRAC

THE OLIVER CORPORATION Cletrac

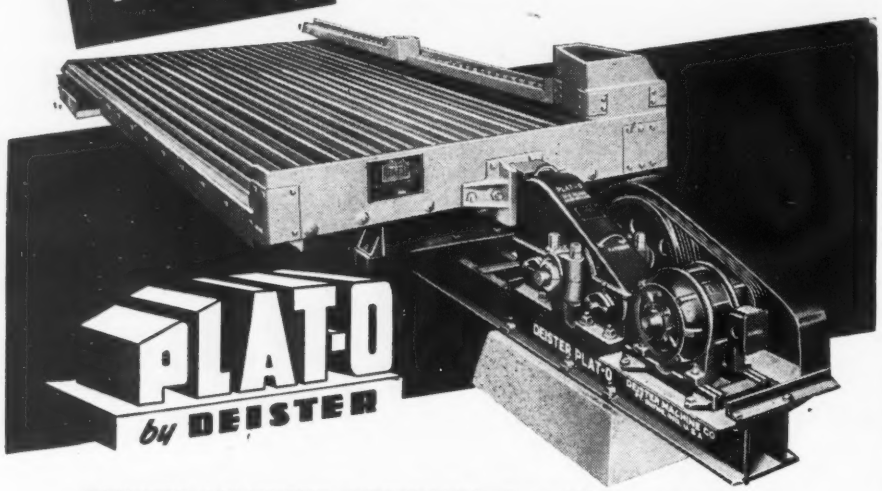
a product of

The OLIVER Corporation

UPS PRODUCTION UPS PROFITS

★ Many coal mine operators are taking advantage of the growing market for smaller sizes . . . are finding that the best way to do it is by installing Plat-O Coal Washing Tables. Why not cash in on their experience yourself by getting complete details about the Plat-O Coal Washing Table for your operations? Write today.

Plat-O Coal Washing Tables are complete, self contained units . . . can be installed as single or multiple units. Each table can reclaim 15 or more tons per hour.



DEISTER MACHINE COMPANY, Fort Wayne 4, Indiana

It's Surprising How
THE RIGHT BEARINGS AND BUSHINGS
Cut Down Maintenance Cost!

THIS IS THE WAY TO BEARING EFFICIENCY

Specializing in bronze bearings and bushings for coal mining equipment with specific formulae for each application. We guarantee superior service or your money back. Parts for Jeffrey, Goodman, Westinghouse, General Electric, Sullivan, Joy Equipment, etc.

PROMET BEARING BRONZES

Will not cut or stick to the shaft under normal conditions, nor powder under severe conditions. In emergencies can be run without lubrication at red heat, suddenly cooled, and returned to service without injury. Can be machined at over 500 feet per minute twice as fast as phosphor bronzes.

PROMET BAR STOCK

Machines easily
Cored or solid.
Rounds • Hexagons • Squares
Rough Cast • Semi-finishes • Fully Machined
Cored stock in all sizes (by ⅛" steps) from a ½" minimum core to 12" O.D. and 12" lengths.

PROMET BRONZE CASTINGS

Any size, shape or section, up to 5000 lbs. ea. to your patterns. Pattern making, designing and machining service.

PROMET MINE SPECIAL BABBITT

It's different. Has a lead base and fine velvety grain. Withstands tremendous loads at high speeds. Will not score, cut or powder even in lubrication failures. The coefficient of friction is considerably less than that of tin babbitts, reducing power loss and wear.

Entire bearing surface wears uniformly without pitting. Manufactured entirely from pure virgin metals, perfectly alloyed and heat-treated. Unaffected by moisture. Simply heat to 900°-950° F. and pour.

Can be heated to 2000° F. without burning or injury. Repouring only refines it. No appreciable shrinkage, hence a better contact with supporting shell, a more solid, rigid bearing. Contains practically no dross. Supplied in 10 lb. pigs.

Write for free booklet.

PROMET THE Engineered BRONZE

THE AMERICAN CRUCIBLE PRODUCTS CO.
1307 Oberlin Ave., Lorain, Ohio, U. S. A.

Prompt deliveries can usually be made from stocks maintained at

BECKLEY, W. Va., The Universal Supply Co., Corner 2nd Ave. and 2nd St. — Phone 3112
LORAIN, OHIO, The American Crucible Products Co. — Phone 5581
WILLIAMSON, W. Va., Williamson Supply Co. — Phone 1200

Other Representatives

ALTOON, ILL., Frank E. Rhine, 623 Blair Ave. — Phone Alton 1-K-28
BIG STONE GAP, VIRGINIA — C. P. Caven
BIRMINGHAM 1, ALA., O. O. Lindstrom Equipment Co. — P. O. Box 1
CANTON, OHIO, Bowell Company, Wainsburg Road — Phone 29-1
MT. LEBANON, PA., J. E. Nieser, 220 Roselawn Blvd. — Phone LE 5-
[illegible] Airport Service, 18th Street at [illegible] — Phone Ma-

and further development of high-alloy steels. At the West Leechburgh (Pa.) plant will be constructed a cold rolling mill of latest design, for rolling stainless and silicon strip steels.

A. O. Smith Corp. has named H. L. Heakin as district representative for northern California, Utah and Nevada with headquarters in San Francisco. He formerly was connected with the Worthington Pump & Machinery Corp., Pacific Foundry Co., Domestic Engineering Corp., Union Switch & Signal Co. and Westinghouse Air Brake Co.

Hercules Powder Co., Wilmington, Del., has elected as vice presidents William R. Ellis, general manager, explosives department, and Mahlon G. Milliken, general manager, cellulose products department. Philip B. Stull, now a vice president, as well as Mr. Ellis and Mr. Milliken were elected to the executive committee. John J. B. Fulenwider has been appointed general manager of the cellulose products department and J. B. Johnson has been made general manager of the explosives department.

Robins Conveyors, Inc. and its affiliate, Hewitt Rubber Corp., have opened a new office in the United Carbon Building, Charleston, W. Va. R. U. Jackson, who has represented Robins in the territory for 15 years, will be in charge of the office, assisted by H. N. Kepler, sales engineer, formerly of the Robins Washington office. Handling Hewitt sales will be Nelson J. Reinhold, who recently joined the company after 14 years with the Cincinnati Rubber Co.

Harlan & Hollingsworth Corp., Wilmington, Del., has named Lewis A. Belding as president to expand the company's postwar activities to include production of freight and mine cars. He recently completed an engineering assignment with Henry J. Kaiser Co. following 15 years of engineering, designing and selling of railroad cars for General American Transportation Corp., Chicago, and his earlier association with the American Car & Foundry Co.

Standard Oil Co. (Indiana) reports that construction has been started on its new research laboratories in Hammond, Ind., near the Whiting refinery, with which the new plant will be connected by pipelines. Structures under way are the main administration building, general laboratories and three pilot-plant buildings. A cafeteria will be included. An engine laboratory, a greenhouse for insecticide work, additional pilot-plant buildings and other research facilities are scheduled for subsequent construction.

General Electric Co., Schenectady, N. Y., has named heads to newly organized sections in its Control Division, new name of the former Industrial Control Division. William M. Anthony is manager sales, industry control section; Edward S. Bush, manager sales, appliance and aircraft control section; S. V. W. Dockstader, manager sales, general purpose control section; William J. Stock, in charge, marketing and promotion section; A. E. Bailey Jr., manager sales, electronic control section.

Wyoming

RED EDGE

RIVETLESS SOCKET FEATHERWEIGHT

Coal Shovels & Scoops

AN ANSWER TO THE MINER'S DREAM

1 - Featherweight.

2 - Perfect Balance.

3 - Rivetless Socket. (*No possibility of sharp edges on socket or handle*)

4 - Alloy Steel, Heat Treated Blade.

5 - Increased efficiency and reduced costs the reason for Red Edge preference.

ARMY E NAVY

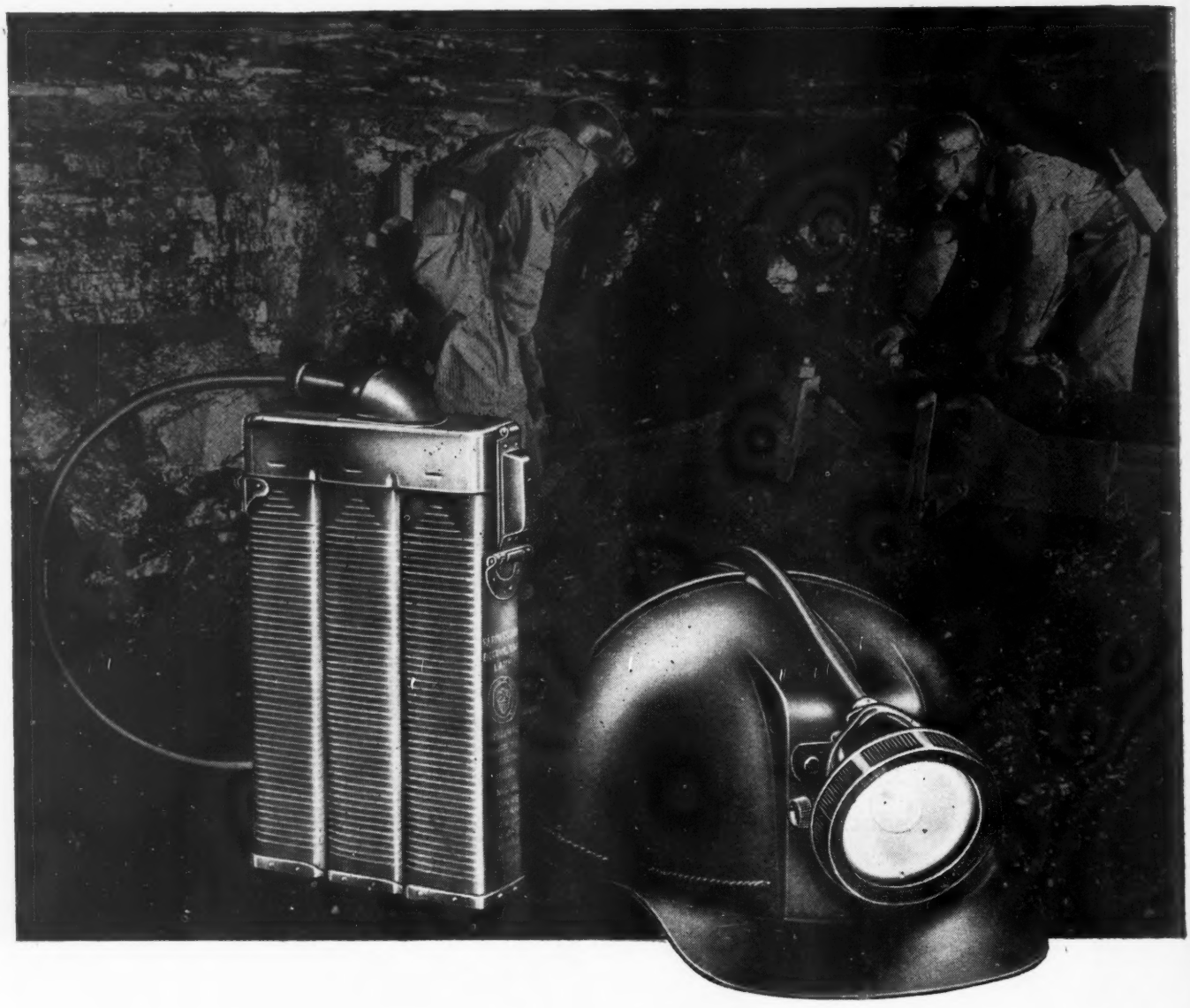
AMES *Since* 1774

"AMES" PRODUCTS

SHOVELS FORKS
SPADES HOES
SCOOPS RAKES
POST HOLE DIGGERS
AGRICULTURAL HANDLES

AMES BALDWIN WYOMING CO.

Parkersburg, W. Va. North Easton, Mass.



Protecting the MEN in Mechanized Mining

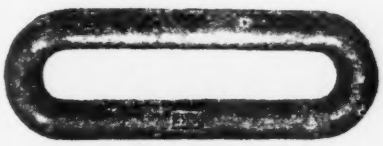
EDISON ELECTRIC CAP LAMPS

M. S. A. COMFO CAPS

The high productivity of America's mechanized mines is a tribute to efficient management—and to the highly-skilled workmen who man the machines. Vital to these miners are the safety factors of *better, more dependable light* and *proved head protection,* provided in top measure by the Edison Electric Cap Lamp and M.S.A. Comfo Cap—serving the nation's need for greater coal production, guarding the men on the job!

MINE SAFETY APPLIANCES COMPANY
BRADDOCK, THOMAS AND MEADE STREETS
PITTSBURGH 8, PA.

FOR SAFETY'S SAKE, SUPERIOR COUPLINGS



Drop Forged Links

Drop forged for strength, Superior Swivel and Single Link Couplings are built to stand the gaff. No welds to let go with resulting wrecks. Superior Couplings on your mine cars will prevent accidents and reduce haulage costs. Order Superior Couplings for your replacements and specify them on new equipment.

DROP FORGED SWIVEL COUPLINGS

PITTSBURGH KNIFE & FORGE CO.

1421 Reedsdale St., N.S.
Pittsburgh 12, Pa.

MOTT DIAMOND CORE DRILLING CONTRACTORS

Mott Type "A" Oil Hydraulic 1500 Ft. Cap., 2¼" Diameter Core.

● Coal and all mineral properties tested—using our light gasoline drills. They save fuel and moving costs . . . guarantee satisfactory and proper cores.

Pre-pressure grouting for mine shafts, ground solidification for wet mine areas by our stop grout method. Water wells and discharge holes drilled and grouted . . . electric drills for inside mine drilling.

MOTT CORE DRILLING CO.
HUNTINGTON • WEST VIRGINIA

K. R. Van Tassel is manager of the Control Division and R. S. Glenn is manager sales.

SPEER CARSON CO. and its affiliate, the International Graphite & Electrode Corp., announces that Dr. Harry G. Mitchell has returned after serving for three years as carbon products consultant for WPB. He has been appointed advertising manager for both organizations with headquarters at the home office in St. Marys, Pa.

ATLAS POWDER CO., Wilmington, Del., has elected Isaac Fogg as president, succeeding Leland Lyon, who was made chairman of the board. F. S. Pollock, general manager of the explosives department, has been elected vice president. Mr. Fogg started with the company in 1913 as confidential secretary in the office of the secretary-treasurer, becoming assistant secretary and assistant treasurer in 1917. He was elected treasurer and member of the board in 1927 and vice president in 1931. Mr. Pollock joined the explosives industry in 1909 as a chemist at Reynolds works of the Potts Powder Co., later acquired by Atlas. After various assignments he became works manager of the Perryville (Md.) nitrate plant in World War I, director of high explosives manufacturing operations in 1927, director of the government Ordnance Works Department in 1942 and general manager of the explosives department later that year.

TIMKEN ROLLER BEARING CO., Canton, Ohio, reports that L. H. Gegenheimer is back in his former capacity as sales engineer in the industrial division after a four-year leave of absence for war duties in Washington. He was first lent to the British Ministry of Supply, where he was supply officer until December, 1943, when he became a dollar-a-year man with the War Production Board. He left OPA to become chief of the Bearing Branch of the Tools Division.

HENDRICK MFG. CO., Carbondale, Pa., has appointed Trowbridge A. Warner as sales manager. He formerly was sales manager of the Register & Grille Mfg. Co. and previous to that held a similar post with the Tuttle & Bailey Mfg. Co.

AMERICAN ROLLING MILL CO. has made Middletown, Ohio, a basing point for the various grades and sizes of stainless-steel sheets and plates made at the Middletown plant.

AMERICAN BRAKE SHOE CO. has elected William T. Kelly Jr. as president of its Kellogg Division after having been executive vice president since last December. J. F. Weller, formerly president of the Kellogg Division, will now devote his full time, as director of automotive sales, to postwar development programs for Kellogg and American Brakelok divisions. Kellogg-American products are manufactured in plants in Rochester, Los Angeles and Niagara Falls, Canada.

WARD LAFRANCE TRUCK DIVISION, Great American Industries, Inc., Elmira, N. Y., has acquired the services, as executive engineer, of Carlisle F. Smith, who resigned from the American LaFrance

THE LATCH LOCKS THE LOAD

When Laughlin's newly-designed latch — providing about 80% of an ordinary hoist hook's throat opening — replaces rope lashing for securing the load in the hook, you not only speed up the job but also make safety *certain*. That's because the men who are *supposed* to lash loads, but *often don't* are relieved of the responsibility.

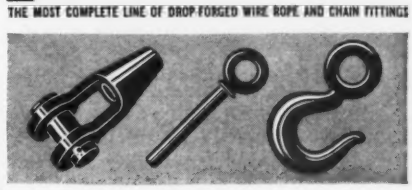
Get better acquainted with these sturdy, drop-forged, heat-treated, standard-type hooks . . . made safe by dependable latches and stainless steel springs . . . ½ to 15 ton safe load.

WRITE FOR CATALOG

All Laughlin hooks — safety, hoist, cargo, etc. — are heat-treated, drop-forged, weldless. Distributed through mill, mine and oil field supply houses. Write (Dept. 6) for catalog. The Thomas Laughlin Co., Portland 6, Me.

LAUGHLIN

THE MOST COMPLETE LINE OF DROP-FORGED WIRE ROPE AND CHAIN FITTINGS



TOUGH . . . BUILT TO TAKE PUNISHMENT

UNDERGROUND OR OPEN PIT

Collyer PORTABLE CABLES

These Heavy Duty Rubber Sheathed Portable Cables meet all the requirements for safe, dependable current conduction in mines and quarries where rough destructive treatment is the accepted rule.

Slippery smooth to prevent abrasive chafing on jagged edges; tough and sturdy to withstand heavy blows; flexible and non-cracking for constant reeling and unreeling; and resistant to flame, heat, chemicals, oils and grease, these durable cables have extra long life and assure troublefree, reliable service. Avoid one source of dangerous and costly equipment failure by replacing your conductors with Collyer Portable Cables — *Built to take punishment.*

Available In Single and Multi-conductors.

Let us know your requirements.

Collyer
INSULATED WIRE CO.
255 ROOSEVELT AVE., PAWTUCKET, R. I.

THESE OUTSTANDING FEATURES MEAN EXTRA PROTECTION

1 Rope-stranded, tinned copper wires for desired flexibility . . . resist both tension and torsion.

2 Heat-resistant synthetic rubber insulation . . . safe for heavy overloads.

3 Multiple conductors cabled with rubber or jute fillers . . . flexible, easy to handle.

4 Rubber cushioning belt, highly resilient, with reinforcing open twine braid.

5 Lead-cured neoprene rubber sheath — dense, tough . . . resistant to flame, chemicals, oil and physical abuse.

ST. LOUIS SNAPSHOTS

THE LUCKY FELLOW,
HE HAS A
RESERVATION
AT THE
HOTEL
Mayfair
EIGHTH AND ST. CHARLES STS.

3-in-1

BLOW — CLEAN — SPRAY with TORNADO

With its 1 h.p. G. E. motor, TORNADO Portable Electric Blower blows dust, dirt and lint out of motors, generators, shafting, etc. With bag and attachments added, it is convertible into a Vacuum Cleaner, for cleaning shelves, bins, floors and light salvaging. With other attachments, it can be made into a Sprayer, for spraying insecticides. Keeps equipment and plant clean for faster production and lower costs. Saves power—reduces hazards—lowers upkeep.

Request details and
FREE TRIAL Offer

BREUER ELECTRIC MFG. CO.
5098 Ravenswood Ave., Chicago 40

TAKE THE DUST OUT OF INDUSTRY
TORNADO
PORTABLE ELECTRIC BLOWER

Foamite Corp. D. L. Gundry has been made chief engineer of the motor truck division, and N. G. Bjorck is acting chief engineer of the fire apparatus division.

Allis-Chalmers Mfg. Co., Milwaukee, has appointed William C. Van Cleaf as director of industrial relations. Entering the company's employment in 1912, he worked in the service and erection department, was promoted to assistant foreman on the electrical test floor, became general supervisor of apprentice training, and then was made employment manager. With reorganization of the industrial relations division, he was made assistant to Lee H. Hill, former head of the department.

Visual Training Corp., Detroit, has announced the adoption of a new name, Florez, Inc., and has realigned its executive personnel. Genaro A. Florez continues as president and chairman of the board. Other directors are Elmer E. Sylvester and R. M. W. Shaw, vice presidents; C. W. Hinz, secretary and treasurer; and Herbert S. Gardner Sr., president of the Birmingham National Bank. Arthur G. Rippey, manager of the company's Denver office, continues as a vice president.

Athey Truss Wheel Co., Chicago, has changed its name to Athey Products Corp. B. F. Lease, president, says its products will bear the trade name "APCOR."

Pittsburgh Plate Glass Co., Columbia Division, has appointed R. M. Simpson as sales representative for Chicago with office at 1721 Tribune Tower Bldg.

Dr. Charles A. Getz, vice president in charge of research for the Cardox Corp., has returned to the company in Chicago after an absence of two months in Europe as one of a group of scientific consultants investigating German industry under the sponsorship of the Foreign Economic Administration. His particular fields of study included coal mining, fire extinguishing and electro chemical developments.

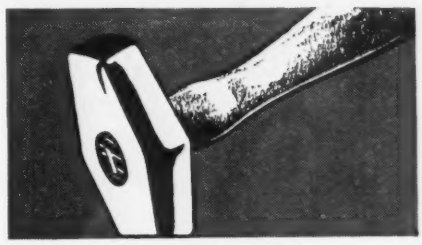
R. G. LeTourneau, Inc., Peoria, Ill., has appointed Walter N. Fischer to the newly created position of assistant to the general sales manager, Gordon S. McKenty. Before joining LeTourneau he had been affiliated with Schramm, Inc., West Chester, Pa.

American Brake Shoe Co. has elected John S. Hutchins as president of the Ramapo Ajax Division. Starting with the division in 1925, he became sales manager in 1941 and executive vice president last year. He succeeds J. Brookes Spencer, who is a vice president of the Brake Shoe Co. and will handle special assignments in connection with railroad sales for all divisions in addition to his responsibilities in charge of the export division. Headquarters of Ramapo Ajax are to be transferred from New York to 332 South Michigan Ave., Chicago.

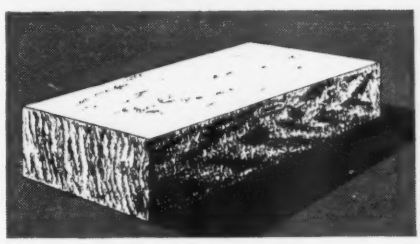
Roberts & Schaefer Co. has begun extensive expansion of its Harvey (Ill.) plant. The added space will be devoted to shop and testing operations and to speeding production of hydro-separators, Hydrotators and Stump air-flow cleaners.

IT'S EASIER AND QUICKER

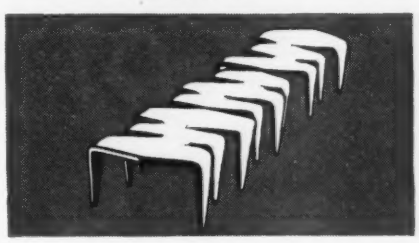
to use this



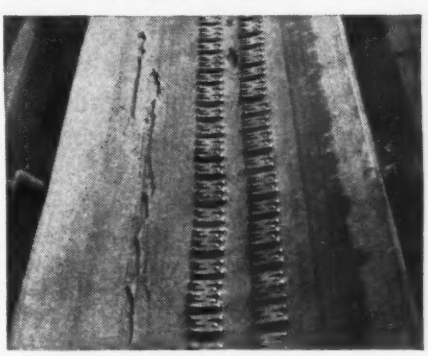
and this



and



to fix this



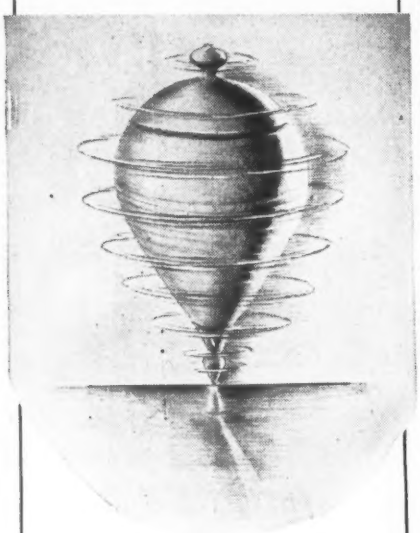
BRISTOL'S BELT LACING

For rubber or woven conveyor belts up to $13/16$" thick.
Write for Bulletin 736.

THE BRISTOL COMPANY
Mill Supply Division
139 Bristol Road, Waterbury 91, Conn.
DISTRIBUTORS EVERYWHERE

The "C·M·I" CONTINUOUS CENTRIFUGAL

This dryer reduces the moisture content of the finer coal sizes to a point where there is no clogging of spouts, cars, bins, etc., also no freezing in transit or storage.



At many plants this machine is also reclaiming sludge and slurry coal and making a product that is sold for use in powdered coal plants, on chain grate stokers or blended back with some of the larger sizes. Much good carbon that had previously been thrown away is now made into a saleable product.

CENTRIFUGAL AND MECHANICAL INDUSTRIES INC.
3600 SOUTH SECOND STREET
ST. LOUIS 18, MO.

American Car & Foundry Co. has appointed as manager of mine-car sales Herman H. Pancake, sales engineer, with headquarters in the New York general office. He succeeds J. L. McDowell, who recently was retired at his own request. G. A. England has been appointed manager of foundry sales. He joined the company in 1923 as assistant chemist in the A.C.F. St. Louis foundry.

La-Del Conveyor & Mfg. Co., New Philadelphia, Ohio, has appointed Fred W. Blaisdell as plant manager. Embarkation on peace-time production has been highlighted by 100 percent increase in the coal-mining equipment division.

Upson-Walton Co., Cleveland, manufacturer of wire rope, fittings, tackle blocks and brattice cloth, has appointed as sales manager Lieut. Franklin P. Clark, recently of the Navy Bureau of Supplies and Accounts.

•

Trade Literature

Centralized Lubricating — Farval Corp., Cleveland. Bulletin Form No. 76, "When You Reconvert," points out advantages of centralized lubricating when installing machine equipment, setting forth basic facts on how the Farval system operates, with statements of specific results attained through its use.

Drainage Products—Armco Drainage & Metal Products, Inc., Middletown, Ohio. Catalog 13 lists drainage and related products for use by a variety of industries including mines, giving reference to more detailed literature.

Cutting Torches and Tips—Victor Equipment Co., 844-54 Folsom St., San Francisco. Catalog Form 52 is devoted to hand and machine cutting torches and many different types and sizes of cutting tips to speed flame cutting operations and assure maximum economy.

Electric Equipment—Keystone Electric Co., Baltimore, Md. Bulletin presents Keystone line of replacement endbells and housings with which sleeve-bearing electric motors and pumps are converted to ball- or roller-bearing operation.

Engineering Products and Literature—Allis-Chalmers Mfg. Co., Milwaukee. Directory lists over 1,600 types of products for use by industry, and descriptive literature is arranged according to product discussed.

Steel Shaft Data—DeLaval Steam Turbine Co., Trenton 2, N. J. Bulletin W. G.-545 gives handy data and short cuts for those whose work involves determination of required shaft sizes. It includes tables, curves and formulas for computing torque, deflection angle of thrust, bending moment, and other factors in solid, hollow, keywayed and stepped shafts.

Arc-Welding Electrodes — Allis-Chalmers Mfg. Co., Milwaukee. Bulletin L6348-A, brought up to date, includes recommendations for proper use of newest additions to the A.-C. line of arc-welding electrodes. Fully described in terms of

QUALITY MARLO PACKING

METALLIC & SEMI-METALLIC
PACKING
for
MINE PUMPS
"The Packing that gets the Repeat Orders"

For deep mine pumps. Resists acid mine waters. Keeps grit out of stuffing box. Three types.

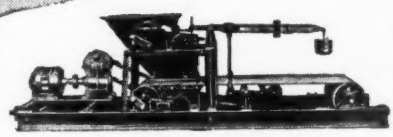
• MARLO ALL PURPOSE METALLIC PACKING
Best ever devised. Will not freeze at 70° below, soft, pliant, like fibrous types, yet easier to handle. Won't cut, score or corrode moving parts.

• "TWIN-TWIST" SEMI-METALLIC PACKING
Metal strands twisted with asbestos. Anti-frictional. Durable. Economical. Remarkable compressibility. Never hardens. For temperature up to 550° F.

• "RED WATER" SEMI-METALLIC PACKING
Most modern development for all hydraulic applications. A solid - packing vegetable fibre combined with metal strands. Retains form under any conditions.

Let us serve you
THE MARLO COMPANY
38 HOWARD ST.
NEW YORK, N. Y., U. S. A.

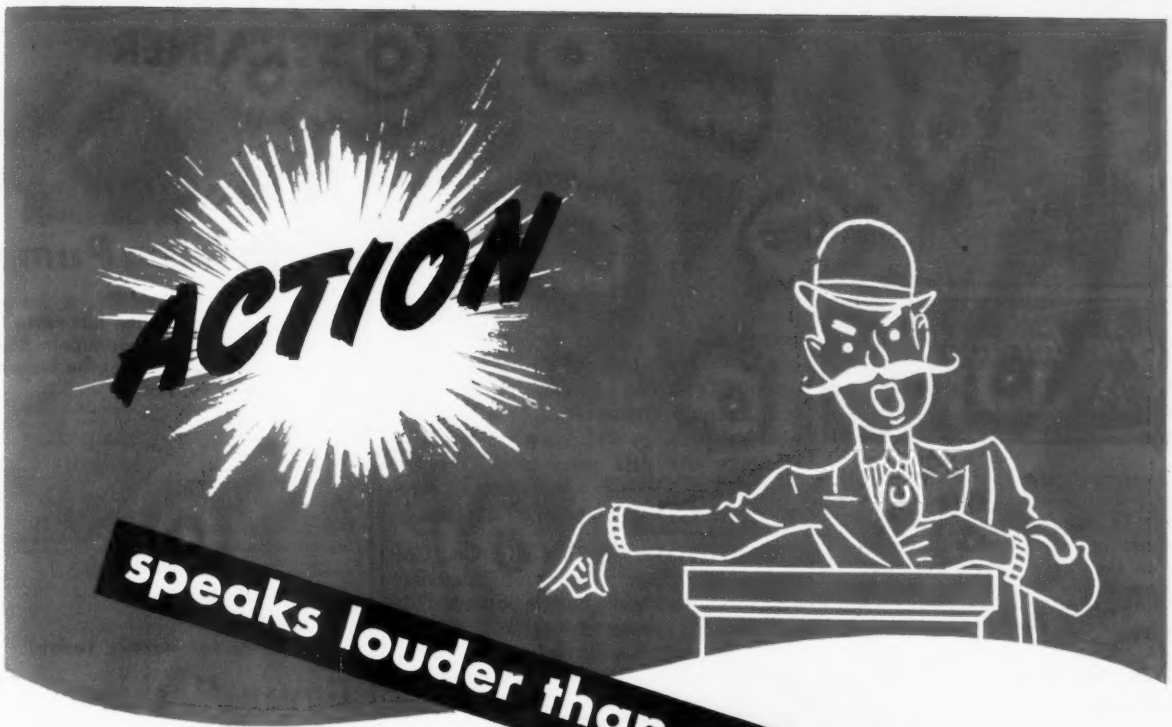
Handle Sizing and Blending of Coal Automatically with the



SCHAFFER POIDOMETER

The SCHAFFER Poidometer automatically proportions, weighs and conveys crushed, granulated, and pulverized coal . . . according to the weights and proportions you want! These units can be used singly or in batteries . . . in pulley centers up to 35' 0", thus eliminating extra conveyors and expense. Our Catalog #8 explains the Poidometer in detail. Write for your copy today.

The Schaffer Poidometer Co.
2828 Smallman St.
Pittsburgh 22 Pennsylvania



HERE ARE THE SIX MAJOR ADVANTAGES THAT RED CROWN OFFERS:

1. Slow heaving and spreading action with results similar to those obtained with the use of black powder.
2. Power distributed evenly throughout the face of the cut.
3. Coal displaced in firm, hard lumps with minimum of pin cracks.
4. Red Crown, *containing no nitro-glycerine*, is the non-headache permissible.
5. Less smoke and fumes mean less idle time for expensive equipment.
6. Red Crown is easy on the roof.

. . . And The Spreading, Heaving, Pushing Action of King Powder's Red Crown Is What We Want To Show You!

It's easy to talk big about any powder—but it's what the explosive does on the job that really counts.

That's why we want to demonstrate King Powder's Red Crown to you.

This patented Grade A Permissible is the biggest advance in mining explosives since permissibles came in.

It works with a spreading, heaving, pushing action—like that of black powder—distributing its power evenly throughout the face of the cut.

But to really understand the superiority of Red Crown, you have to see Red Crown in action.

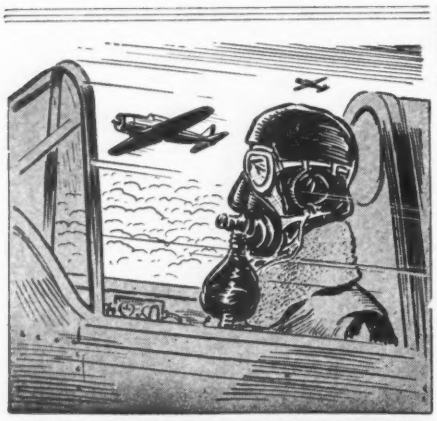
A demonstration in your mine—under your particular operating conditions—will convince you.

Arrange for that demonstration today. See your Red Crown representative, or get directly in touch with The King Powder Co., Inc., Cincinnati 1, Ohio.

THE KING POWDER CO., INC., CINCINNATI 1, OHIO
INCORPORATED 1878

RED KING CROWN

THE PATENTED, SURFACE-SENSITIZED PERMISSIBLE



They've Got to Have AIR

Up in rarified atmosphere, sufficient oxygen is most vital to the crews of our planes. To insure an adequate supply, all planes are equipped with oxygen tanks so that at all times our flyers can have ample oxygen and thus be able to perform at greatest possible efficiency.

For greater safety and more efficient ventilation, specify ABC Brattice Cloth. Flame, water, fungus, and abrasion will not harm it . . . passing cars or machinery cannot pull it down or tear it. Closely woven construction insures maximum wear-resistant quality and minimum air-leakage.

Combined, these features assure you of the finest quality and results.

Investigate . . . get the facts on ABC—the better brattice cloth.

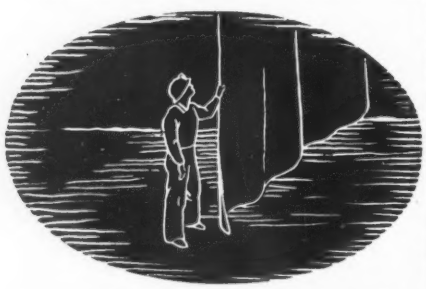
•

Invest in Victory

BUY VICTORY BONDS

•

ABC
JUTE BRATTICE CLOTH



AMERICAN
BRATTICE CLOTH CORP.
WARSAW - INDIANA

usage, contents, hardness and welding procedure, the new additions include chrome moly hard-facing and hard-surfacing, nickel manganese and mo-manganese welding rods, as well as five types of stainless-steel rods. Specific tips on these electrodes include the following: The hard-facing chrome moly has an air-hardened surface that resists severe impact as well as abrasion and can be forged and air-cooled without losing its hardness. On the other hand, the hard-surfacing chrome moly is recommended for parts encountering severe abrasion and moderate impact such as coal-cutter bits, mullers, mixing parts, pump shells and pump impellers.

PUMP PLUNGERS—Aldrich Pump Co., Allentown, Pa. Data Sheet No. 57-2 describes Kosmos porcelain plungers, which can be used on almost any hydraulic pump up to 2,000 p.s.i. In addition to telling of the savings said to result from decreased wear on packings and increased operating efficiency the data sheet gives complete construction details, specifications, types of service and purchasing information.

COAL CUTTERS—Jeffrey Mfg. Co., Columbus 16, Ohio. Catalog 787 describes Series 35 shortwall cutters designed to feature such characteristics as simplified operation, rugged construction, low maintenance, safety to runner and accessibility.

SILICONES—Dow Corning Corp., Midland, Mich. Bulletin lists D. C. silicone products now available, with charts and graphs showing the unusual properties of this family of organo-silicon-oxide polymers. D. C. silicones are produced in many forms, including fluids, greases and compounds, resins and varnishes, and Silastic (silicone rubber).

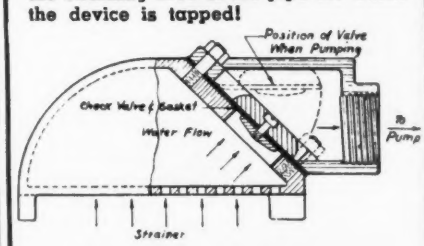
EXTENSIBLE-TIP SPLICE — Manhattan Rubber Mfg. Div. of Raybestos-Manhattan, Inc., Passaic, N. J. Bulletin Form No. 6861 describes extensible-tip splice and how it prolongs the life of Condor endless belts with extended-area stress relief. Containing numerous endless-belt-installation pictures and schematic diagrams describing the splice, it cites these five advantages: increases flexibility at splice; can be operated over small pulleys can be operated at higher speeds and heavier loads; prolongs splice three to ten times; reduces belt and maintenance costs.

INSULATION—Dow Corning Corp., Midland, Mich. Bulletin describes D. C. 996 silicone varnish for insulating electrical equipment, said to provide greater protection against failure due to sustained overloads; greatly increased service life of electrical insulation; higher permissible operating and ambient temperatures; increased protection against excessive moisture even after prolonged exposure to elevated temperatures; elimination of fire hazards resulting from failure of conventional electrical insulation; and increased power output per unit weight.

WELDING ACCESSORIES—Air Reduction, 60 East 42d St., New York 17. Catalog 40 of Airco gas welding and cutting supplies and accessories contains illustrations, descriptions, engineering data and current prices. Types of equipment covered in-

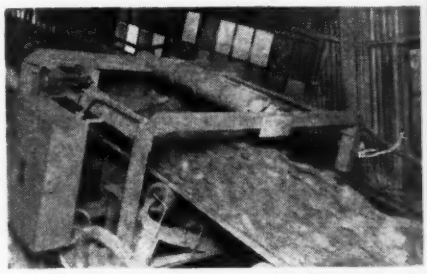
G.M.C.
COMBINATION FOOT-VALVE STRAINER
for Mine Gathering Pumps

A device that answers a long-felt need . . . a combination foot-valve and strainer that has approximately double the straining area of the pipe for which the device is tapped!



Write for details today!

Guyan Machinery Co.
Logan, West Virginia



TRAMP IRON
INSURANCE

DETECT tramp iron in coal. Dings Detectors signal the presence of iron and steel and will stop a belt so the metal may be removed. Detects the smallest objects over the entire belt width.

Write for data on Dings Detectors and High Intensity Magnetic Separators.

Dings Magnetic Separator Co.
506 E. Smith St. Milwaukee 7, Wis.

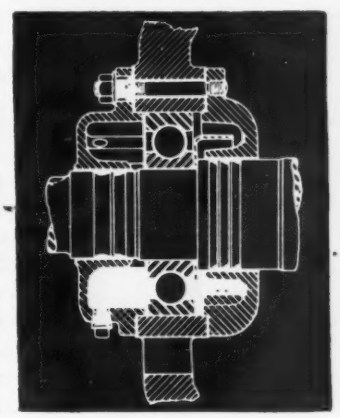
THIS MOTOR HAS

TWO UNIQUE "COAL MINING" FEATURES

1. IMPREGNATION OF WINDINGS — All field windings of Crocker-Wheeler Mine Motors are vacuum impregnated with high grade varnish to protect the conductors from the effects of dirt, moisture and other factors which cause premature breakdown of insulation.

Complete armatures are vacuum impregnated with Navy grade black baking varnish or impregnated by slow immersion in a special, penetrating, synthetic varnish. They are given two additional dips and baked after each dip.

The process of vacuum impregnation is well known to industry through its use in the construction of transformers and underground transmission cables. It is not used generally in building motors because it is an expensive process, requiring very costly equipment.



2. PATENTED BEARING SEAL — The most desirable lubricant for anti-friction bearings is a very soft fluid grease, which will circulate freely between the balls or rollers and the retainer. But because this type of grease is difficult to retain, a stiff grease (which does not lubricate as well) is generally used in motors.

The patented seal employed in Crocker-Wheeler Mine Motors is such that a low viscosity grease (much softer than is customary in motors) can be retained. There is no leakage from the housing because the grease itself forms an airtight seal where the shaft passes through the bearing caps. Dirt and other foreign matter cannot enter the bearing under normal operating conditions. The result is an anti-friction bearing that, except under extremely adverse conditions, requires regreasing less frequently than the average machine.

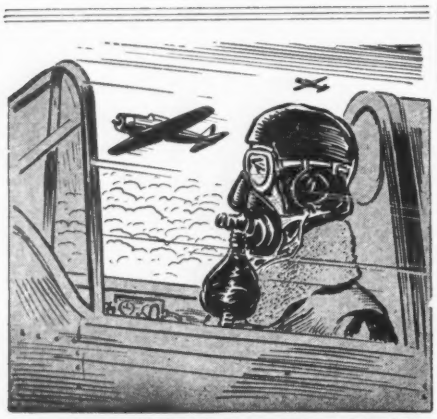
A Crocker-Wheeler field engineer will be glad to give you further details of these unusual motors — at your convenience. Why not call today? CW-12

CROCKER-WHEELER ELECTRIC

A DIVISION OF JOSHUA HENDY IRON WORKS, AMPERE 5, NEW JERSEY

Branch Offices: BOSTON · BUFFALO · CHICAGO · CINCINNATI · CLEVELAND · DETROIT · LOS ANGELES · NEW YORK · PHILADELPHIA · PITTSBURGH · SAN FRANCISCO · WASHINGTON

SQUIRREL CAGE MOTORS · WOUND ROTOR MOTORS · DIRECT CURRENT MOTORS · GENERATORS · FLEXIBLE COUPLINGS



They've Got to Have AIR

Up in rarified atmosphere, sufficient oxygen is most vital to the crews of our planes. To insure an adequate supply, all planes are equipped with oxygen tanks so that at all times our flyers can have ample oxygen and thus be able to perform at greatest possible efficiency.

For greater safety and more efficient ventilation, specify ABC Brattice Cloth. Flame, water, fungus, and abrasion will not harm it . . . passing cars or machinery cannot pull it down or tear it. Closely woven construction insures maximum wear-resistant quality and minimum air-leakage.

Combined, these features assure you of the finest quality and results.

Investigate . . . get the facts on ABC—the better brattice cloth.

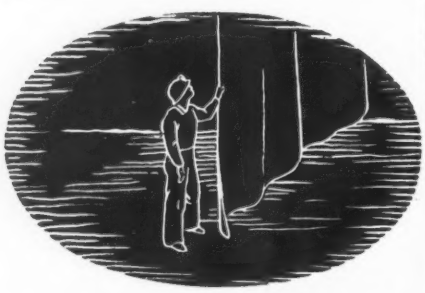
•

Invest in Victory

BUY VICTORY BONDS

•

ABC
JUTE BRATTICE CLOTH



AMERICAN
BRATTICE CLOTH CORP.
WARSAW - INDIANA

usage, contents, hardness and welding procedure, the new additions include chrome moly hard-facing and hard-surfacing, nickel manganese and mo-manganese welding rods, as well as five types of stainless-steel rods. Specific tips on these electrodes include the following: The hard-facing chrome moly has an air-hardened surface that resists severe impact as well as abrasion and can be forged and air-cooled without losing its hardness. On the other hand, the hard-surfacing chrome moly is recommended for parts encountering severe abrasion and moderate impact such as coal-cutter bits, mullers, mixing parts, pump shells and pump impellers.

PUMP PLUNGERS—Aldrich Pump Co., Allentown, Pa. Data Sheet No. 57-2 describes Kosmos porcelain plungers, which can be used on almost any hydraulic pump up to 2,000 p.s.i. In addition to telling of the savings said to result from decreased wear on packings and increased operating efficiency the data sheet gives complete construction details, specifications, types of service and purchasing information.

COAL CUTTERS—Jeffrey Mfg. Co., Columbus 16, Ohio. Catalog 787 describes Series 35 shortwall cutters designed to feature such characteristics as simplified operation, rugged construction, low maintenance, safety to runner and accessibility.

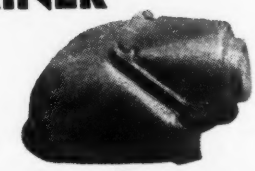
SILICONES—Dow Corning Corp., Midland, Mich. Bulletin lists D. C. silicone products now available, with charts and graphs showing the unusual properties of this family of organo-silicon-oxide polymers. D. C. silicones are produced in many forms, including fluids, greases and compounds, resins and varnishes, and Silastic (silicone rubber).

EXTENSIBLE-TIP SPLICE — Manhattan Rubber Mfg. Div. of Raybestos-Manhattan, Inc., Passaic, N. J. Bulletin Form No. 6861 describes extensible-tip splice and how it prolongs the life of Condor endless belts with extended-area stress relief. Containing numerous endless-belt-installation pictures and schematic diagrams describing the splice, it cites these five advantages: increases flexibility at splice; can be operated over small pulleys can be operated at higher speeds and heavier loads; prolongs splice three to ten times; reduces belt and maintenance costs.

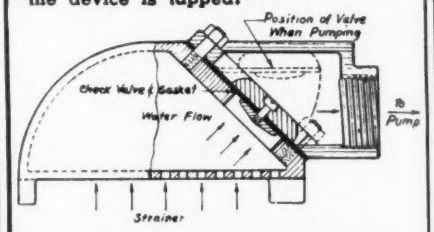
INSULATION—Dow Corning Corp., Midland, Mich. Bulletin describes D. C. 996 silicone varnish for insulating electrical equipment, said to provide greater protection against failure due to sustained overloads; greatly increased service life of electrical insulation; higher permissible operating and ambient temperatures; increased protection against excessive moisture even after prolonged exposure to elevated temperatures; elimination of fire hazards resulting from failure of conventional electrical insulation; and increased power output per unit weight.

WELDING ACCESSORIES—Air Reduction, 60 East 42d St., New York 17. Catalog 40 of Airco gas welding and cutting supplies and accessories contains illustrations, descriptions, engineering data and current prices. Types of equipment covered in-

G.M.C.
COMBINATION FOOT-VALVE STRAINER
for Mine Gathering Pumps



A device that answers a long-felt need . . . a combination foot-valve and strainer that has approximately double the straining area of the pipe for which the device is tapped!



Write for details today!

Guyan Machinery Co.
Logan, West Virginia

TRAMP IRON
INSURANCE

DETECT tramp iron in coal. Dings Detectors signal the presence of iron and steel and will stop a belt so the metal may be removed. Detects the smallest objects over the entire belt width.

Write for data on Dings Detectors and High Intensity Magnetic Separators.

Dings Magnetic Separator Co.
506 E. Smith St. Milwaukee 7, Wis.

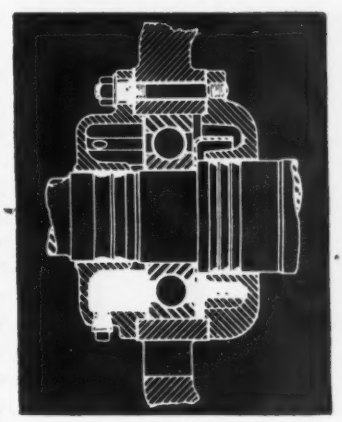
THIS MOTOR HAS

TWO UNIQUE "COAL MINING" FEATURES

1. IMPREGNATION OF WINDINGS — All field windings of Crocker-Wheeler Mine Motors are vacuum impregnated with high grade varnish to protect the conductors from the effects of dirt, moisture and other factors which cause premature breakdown of insulation.

Complete armatures are vacuum impregnated with Navy grade black baking varnish or impregnated by slow immersion in a special, penetrating, synthetic varnish. They are given two additional dips and baked after each dip.

The process of vacuum impregnation is well known to industry through its use in the construction of transformers and underground transmission cables. It is not used generally in building motors because it is an expensive process, requiring very costly equipment.



2. PATENTED BEARING SEAL — The most desirable lubricant for anti-friction bearings is a very soft fluid grease, which will circulate freely between the balls or rollers and the retainer. But because this type of grease is difficult to retain, a stiff grease (which does not lubricate as well) is generally used in motors.

The patented seal employed in Crocker-Wheeler Mine Motors is such that a low viscosity grease (much softer than is customary in motors) can be retained. There is no leakage from the housing because the grease itself forms an airtight seal where the shaft passes through the bearing caps. Dirt and other foreign matter cannot enter the bearing under normal operating conditions. The result is an anti-friction bearing that, except under extremely adverse conditions, requires regreasing less frequently than the average machine.

A Crocker-Wheeler field engineer will be glad to give you further details of these unusual motors — at your convenience. Why not call today? CW-12

CROCKER-WHEELER ELECTRIC

A DIVISION OF JOSHUA HENDY IRON WORKS, AMPERE 5, NEW JERSEY

Branch Offices: BOSTON · BUFFALO · CHICAGO · CINCINNATI · CLEVELAND · DETROIT · LOS ANGELES · NEW YORK · PHILADELPHIA · PITTSBURGH · SAN FRANCISCO · WASHINGTON

SQUIRREL CAGE MOTORS · WOUND ROTOR MOTORS · DIRECT CURRENT MOTORS · GENERATORS · FLEXIBLE COUPLINGS

National CLASSIFIED ADVERTISING

for bringing business needs or opportunities to the attention of other men associated in executive management, sales and responsible technical, engineering and operating capacities with the industries served by . . .

The SEARCHLIGHT SECTIONS
(Classified Advertising)
of these McGraw-Hill publications

Air Transport
American Machinist
Aviation
Aviation News
Business Week
Bus Transportation
Chemical & Met Engineering
Coal Age
Construction Methods
Electrical Contracting
Electrical Merchandising
Electrical World
Electronics
Engineering & Mining Journal
Engineering News-Record
E. & M. J. Markets
Factory Management & Maint.
Food Industries
Power
Product Engineering
Textile World

For advertising rates or other information, write:
Departmental Staff

McGRAW-HILL PUBLISHING CO., INC.
330 W. 42nd Street **New York 18, N. Y.**

PROFESSIONAL SERVICES

ALLEN & GARCIA CO.
ENGINEERS AND BUILDERS OF MODERN COAL OPERATION
Authoritative Valuations, and Reports of Mining Properties Equipment and Operation.
332 S. Michigan Ave., Chicago
120 Wall Street, New York, N. Y.

INDUSTRIAL SAFETY SERVICE
COAL MINING
Consulting Safety Engineer
Management—Labor Relations
30½ Capital St., Charleston, W. Va. Telephone 62-180
P. O. Box 546

HAROLD G. BURRILL
AND ASSOCIATES
Registered Professional Engineer
Power Plants, Mine Ventilation, Haulage and Drainage
Mine Mechanization
Temporary Address: Quarters 56, Aberdeen Proving Ground, Md.

C. C. MORFIT & ASSOCIATES
Consulting Engineers
Reports, Valuation, Construction, Operation, Management
11 Broadway, New York 4, N. Y.

EAVENSON & AUCHMUTY
Mining Engineers
Coal Operation Consultants
Valuation
2720 Koppers Bldg. Pittsburgh 19, Pa.

McNEIL & McNEIL
Engineers
179 W. Washington St. Chicago 2

J. H. FLETCHER
30 Years
Continuous Consulting Service to Coal Mines
Telephone Harrison 5151
McCormick Building Chicago, Illinois

SHERWIN and JANVRIN
Mining Engineers
Pineville, Ky.
Reports on COAL PROPERTIES
Planning, Construction & Supervision

T. W. GUY
COAL PREPARATION
To Yield Maximum Net Return
Face and Product Studies
Plant Design and Operation
Coal Sampling
Kanawha V. Bldg. Charleston, W. Va.

L. E. YOUNG
Consulting Engineer
MINE MECHANIZATION
MINE MANAGEMENT
Oliver Building—Pittsburgh, Pa.

clude welding rods, brazing and welding flux, hose, brazing alloys, goggles and spectacles, gloves for gas welding and cutting, and sparklighters and tips. Also listed are carbon rods and plates, hard-facing rods, cobalt borium inserts, pea borium and other items. Information concerning properties and uses accompanies each article listed.

SAFETY CONTROL—Viking Instruments, Inc., Stamford, Conn. Data Sheet R-18 describes Viking Type R-18 safety control system for the shutdown of diesel engines when temperature of the circulating water system becomes too high or when there is insufficient lubricating-oil pressure. Complete information is given on operation, with detail drawings of general arrangements, installation and operating instructions.

INDUSTRIAL MACHINERY—Lake Shore Engineering Co., Iron Mountain, Mich. Bulletin 452 describes industrial machinery, castings, mining machinery, marine winches and specialized industrial products. In addition to showing wide range of typical items the bulletin shows the company's facilities for manufacturing products on contract or building special equipment.

POLLUTION REMOVAL AND BYPRODUCT RECOVERY EQUIPMENT—Hardinge Co., York, Pa. Bulletin describes rectangular and circular clarifiers, flocculating equipment, hydro-classifier, automatic backwash rapid sand filter and Hardinge thickener, pointing out important safety features.

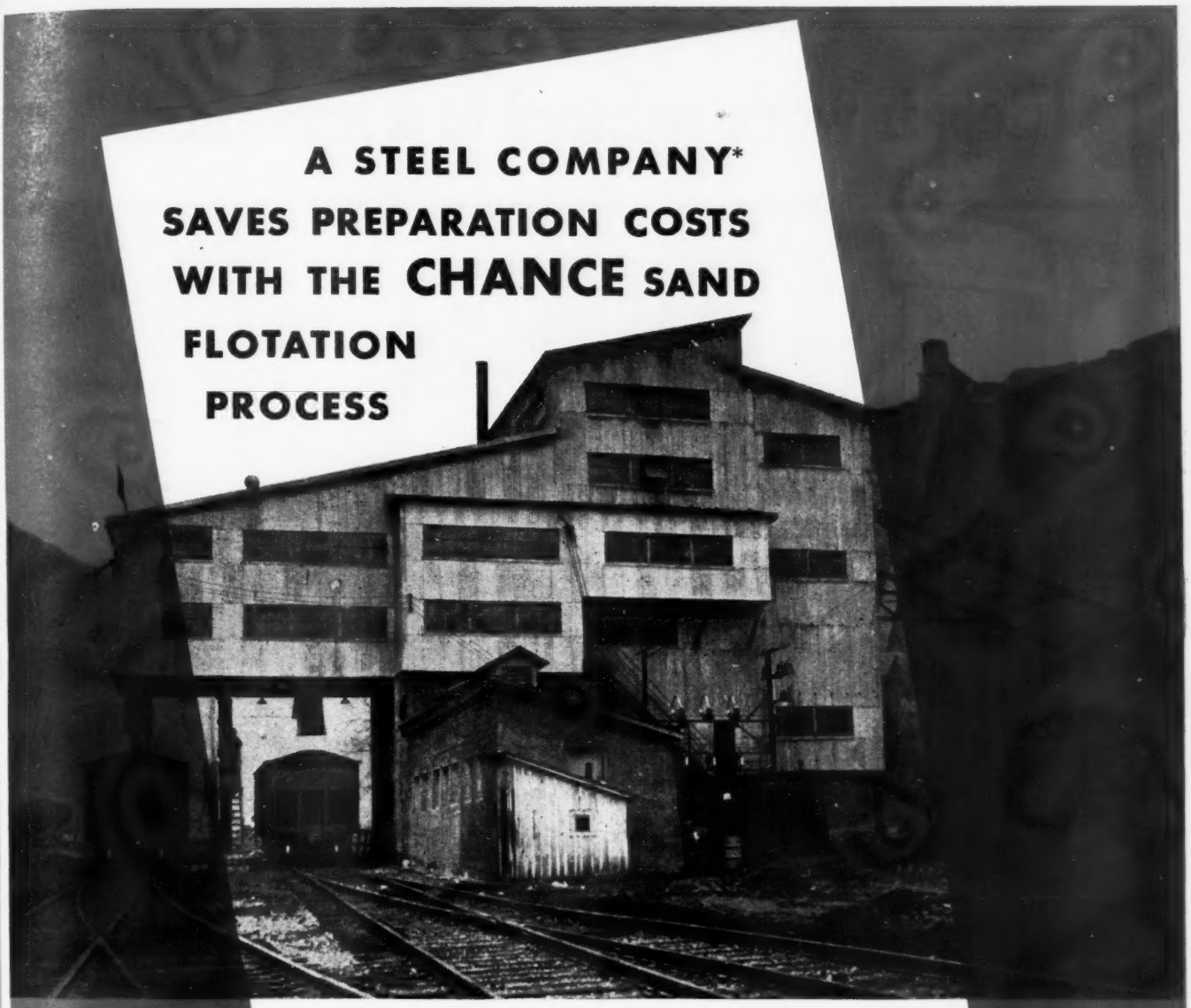
METALLIZING GUN—Metallizing Co. of America, Chicago 4. Circular describes the new Mogul Model F metallizing gun, giving complete information on construction features, including exploded view of gun parts; spraying speeds and gas consumption; also shows equipment necessary for a complete metallizing set-up, together with prices.

FLEXIBLE COUPLINGS—Thomas Flexible Coupling Co., Warren, Pa. Folders describe units that are said to operate without friction, backlash, point or line contacts, noise, wear or lubrication.

SWITCH OPERATING MECHANISMS AND CONTROLS—Delta-Star Electric Co., 2400 Block, Fulton St., Chicago 12. Bulletin 4508 describes and diagrammatically shows nine of the more useful arrangements of mechanisms to best solve the problem of what is the proper arrangement or location of group-controlled disconnecting switch operating mechanisms. In addition, phase spacings for the various types of ratings from 7.5 to 161 kv. are given.

TRACTORS—Caterpillar Tractor Co., Peoria 8, Ill. Bulletin Form 8995, "Today It's Tracks and Rubber," outlines the three zones on earthmoving: Zone 1, power area; Zone 2, slow-speed hauling area, and Zone 3, high-speedhauling area. How track-type and wheel-type tractors meet the requirements of these three main zones and how they adapt themselves to the varied problems of earthmoving is told by words and many graphic illustrations.

A STEEL COMPANY* SAVES PREPARATION COSTS WITH THE CHANCE SAND FLOTATION PROCESS



By producing a product of uniform quality and a washer reject containing little if any good coal

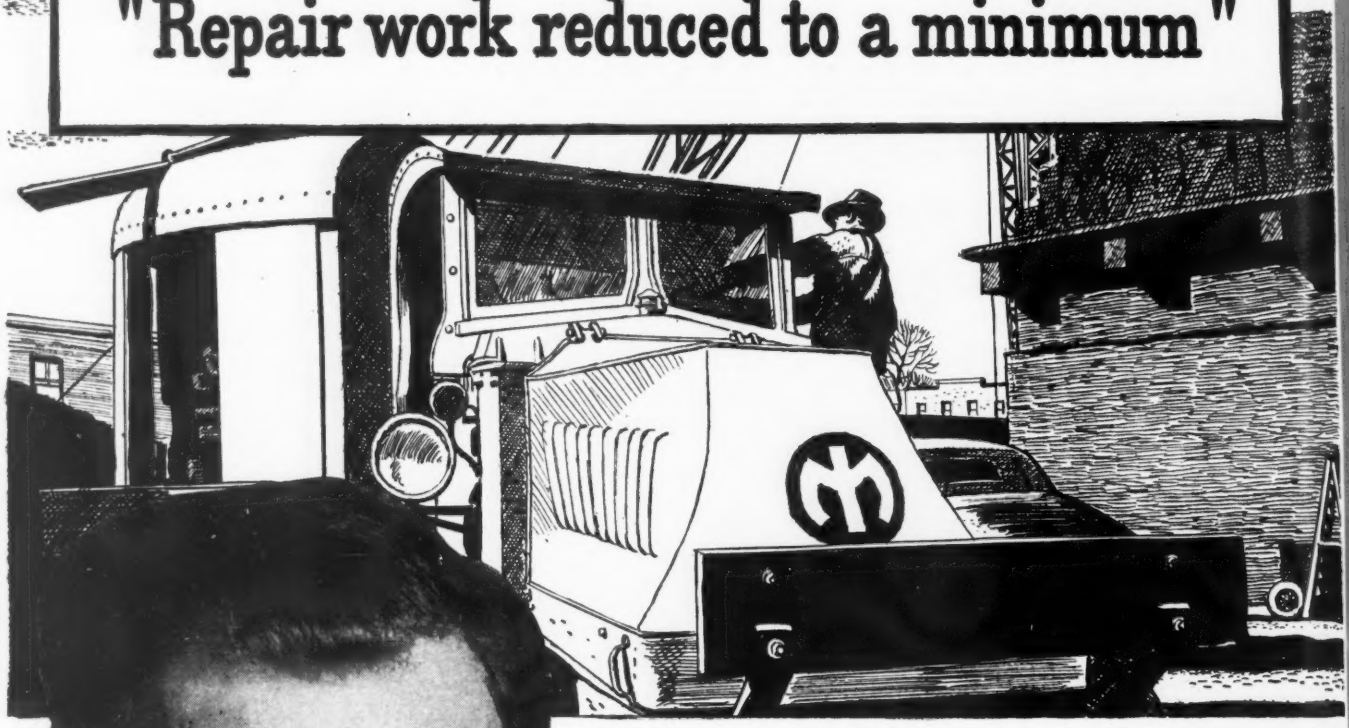
These two features are well worth noting! THE CHANCE SAND FLOTATION PROCESS for Cleaning Bituminous Coal is today being used by leading coal operators everywhere. REPEAT ORDERS are proof of its efficiency and economy in cleaning coal.

*Name on request

United Engineers & Constructors Inc.

NEW YORK PHILADELPHIA CHICAGO

"Repair work reduced to a minimum"



"...our business...construction and heavy lifting, pays off strictly on performance with no alibis accepted.

...we have been using Macmillan Ring-Free Motor Oil in all our equipment* for the last four years with uniformly satisfactory results.

...most of our equipment is in continuous operation, six days a week, in all kinds of weather. We notice the advantage of Macmillan Ring-Free especially in winter when our men are able to start the motors wth 2 or 3 turns of the crank, even on the coldest mornings.

...during the four years we have been using your oil, we have not had a single burned bearing or breakdown because of carbon on the rings...our repair work has been reduced to a minimum.

...in these days when repairs and replacements are difficult, Macmillan Ring-Free has stood by us like a good friend."

Excerpts of letter from CRANES, Inc. —one of a series of testimonial letters from all parts of the United States.

J. H. Snyder

Chief Mechanic, CRANES, Inc.,
Maspeth, Long Island

MACMILLAN RING-FREE MOTOR OIL

*Equipment operated by Cranes, Inc. includes: two 16-ton Link Belt truck cranes with 120 ft. booms, powered by six cylinder Waukesha motors; three P-H thirty-ton truck cranes powered by Waukesha motors mounted on four cylinder A-C Mack trucks, five to seven years old; two Schramm compressors, one and two tons, respectively, powered by Buda motors; four Hobart welders, powered by six cylinder Chrysler motors; two P-H welders, one mounted on a six year old Ford V-8, and one on a five year old Pontiac 8; a sixteen-ton double drum hoist which is fifteen years old; a 1942 three-and-a-half-ton Mack truck and a 1942 Chevrolet two-ton truck. *All on Macmillan Ring-Free, of course!*

MACMILLAN PETROLEUM CORPORATION

60 W. 50th Street, New York 20 • 624 S. Michigan Avenue, Chicago 5 • 530 W. Sixth Street, Los Angeles 14 • Copyright 1945, Macmillan Petroleum Corporation

TO MILLIONS and MILLIONS of AMERICANS...

THE Bituminous Coal Institute carries on the only organized activity continuously to inform the public of the importance of coal as a basic commodity and of coal's advantages over substitute fuels, to correct misimpressions about mining and miners, and to build increased stature and respect for the Bituminous Coal Industry.

Outstanding among the Institute's activities is its comprehensive publicity program. Working hand in hand with paid advertising, it reaches the public through newspapers, magazines, radio, movies, schools, and special exhibits.

For example, in the past year, 24 different constructive, informative stories about coal were placed in 1,256 newspapers. Other favorable, truthful articles were placed before almost 17,000,000 readers of Time, Collier's, and other national magazines. An estimated audience of nearly 5,000,000 was reached by radio. The added support won from movies, informative exhibits and books added many more millions to the potential aggregate audience for this publicity campaign!

The purpose of the Institute is to keep right on informing more and more people, more and more often, of the facts about coal and the coal industry. If you are not already among the progressive, forward-looking operators who are making this constructive program possible, write to the address below for additional information.

BITUMINOUS COAL INSTITUTE

60 EAST 42ND STREET, NEW YORK 17, N. Y.

A fast way to get motors...

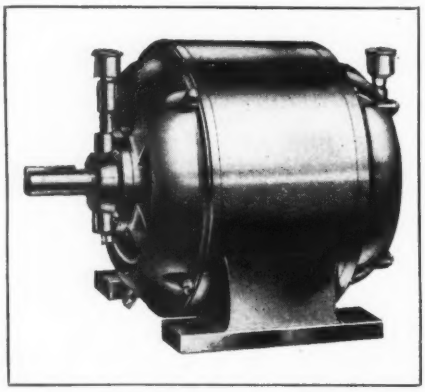
This suggestion is not addressed to buyers who use standard motors, although for them Star also has good news: Star began production of a large range of standard motors for stock weeks ago, and early delivery of some of these can be made.

To makers of products which require a motor that is somewhat "special" in frame design or mounting arrangement, Star's Welded Steel Construction may be a time-saver of great importance *right now.*

Star pioneered this method of construction, and developed unique production welding facilities to save the time and money that went into patterns and castings once required for "special motor" customers.

Exceptional strength and shock resistance is also gained through Star's Welded Steel Construction. This led to extensive use of Star Motors by the Navy long before the war.

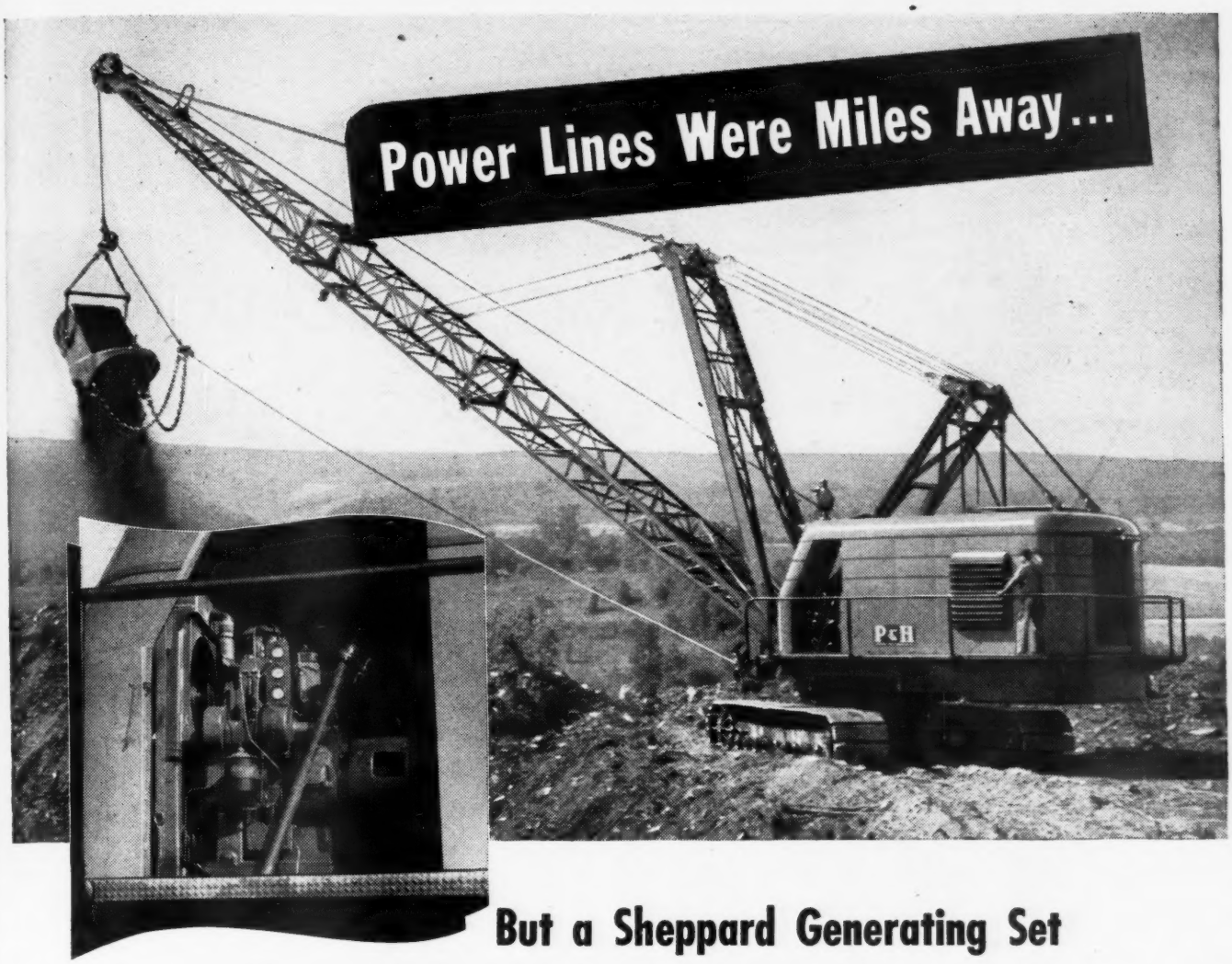
A number of prominent concerns, needing motors that vary from standard, have found that Star can help them to get motors faster than they thought possible. Star may be able to reduce *your* wait for motors. To find out, send a description of your requirements to Star Electric Motor Co., 209 Bloomfield Avenue, Bloomfield, New Jersey.



AC and DC Motors ⅛ to 200 HP;
AC and DC Generators to 150 KW

STAR MOTORS

POWER PACKAGED AS YOU NEED IT



But a Sheppard Generating Set Delivered POWER SAVINGS Right to the Spot!

THE Colitz Coal Company, Inc. of Pottsville, Pa., operates a strip mine far from commercial power lines. But Colitz not only obtains *dependable* power . . . it obtains it at a *saving* with a Model 7 Sheppard Diesel Generating Set.

This generating set supplies lights and auxiliary power in and around the dragline shown above. It operates 14 hours a day . . . *yet it has never cost Colitz one cent for major repairs or maintenance.*

It was selected for its *compactness and superior performance.* You can see for yourself the snug quarters in which this Sheppard operates. As for performance, we quote Colitz:

> **"Our Sheppard Diesel has more than paid its way through savings in power cost and maintenance. We have found the price of Sheppard power to be well under that of commercial power."**

When you operate far from power lines . . . or even if they're strung right to your plant . . . a Sheppard Diesel Generating Set is the power source to investigate before you specify any other. Mail coupon today for free bulletin and specifications on Sheppard Generating Sets.

POWER UNITS, 8 TO 56 HP • GENERATING SETS, 3 TO 36 KW

Sheppard
ALL AMERICAN **DIESEL**
GENERATING SETS

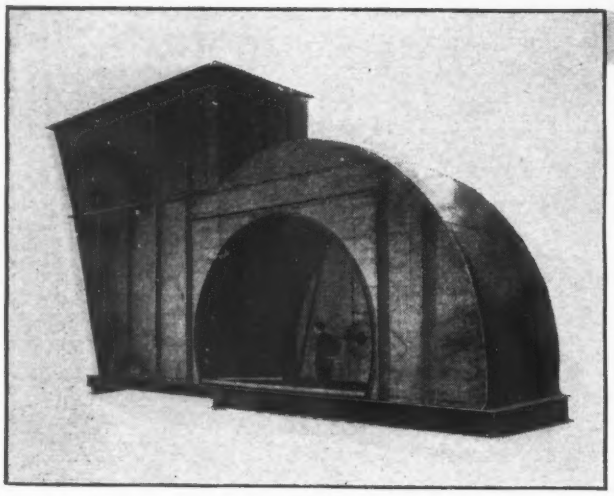
R. H. Sheppard Company
2311 Middle St., Hanover, Pa.

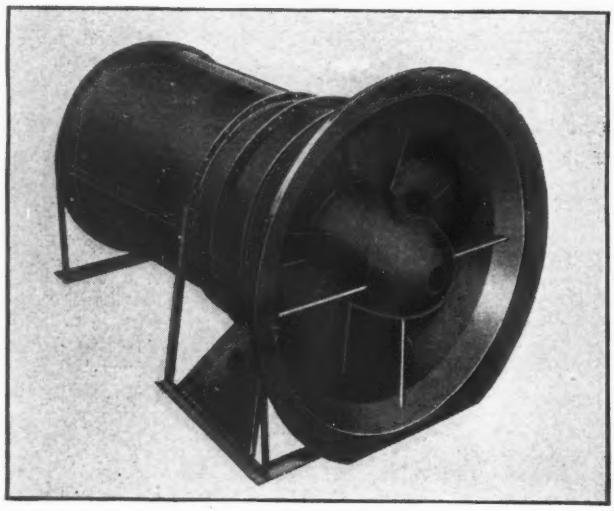
Please send me free literature describing Sheppard Diesel Generating Sets.

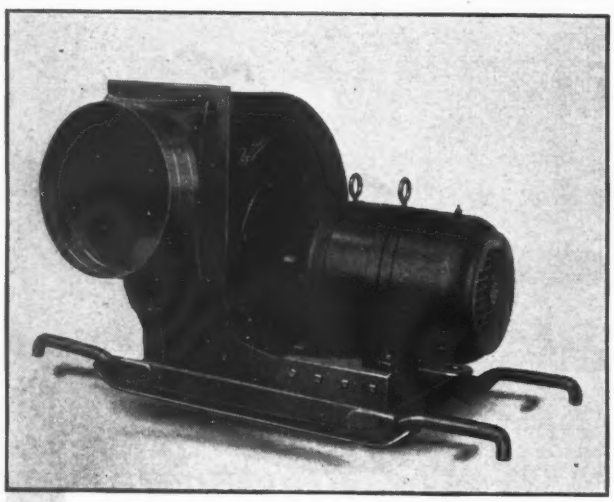
*Name*_____

*Firm Name*_____

*Address*_____







MINE MODERNIZATION *includes efficient ventilating* FANS

• In the mechanization of most mines there is a revamping of ventilating equipment which is perhaps the most important part of the program. In many of these modernized mines, Buffalo Ventilating Fans are being installed. Fan builders for 67 years, Buffalo engineers are able to offer you equipment which exactly meets your requirements and which can be altered economically to meet future demands. Why not let our engineers make recommendations—no obligation of course.

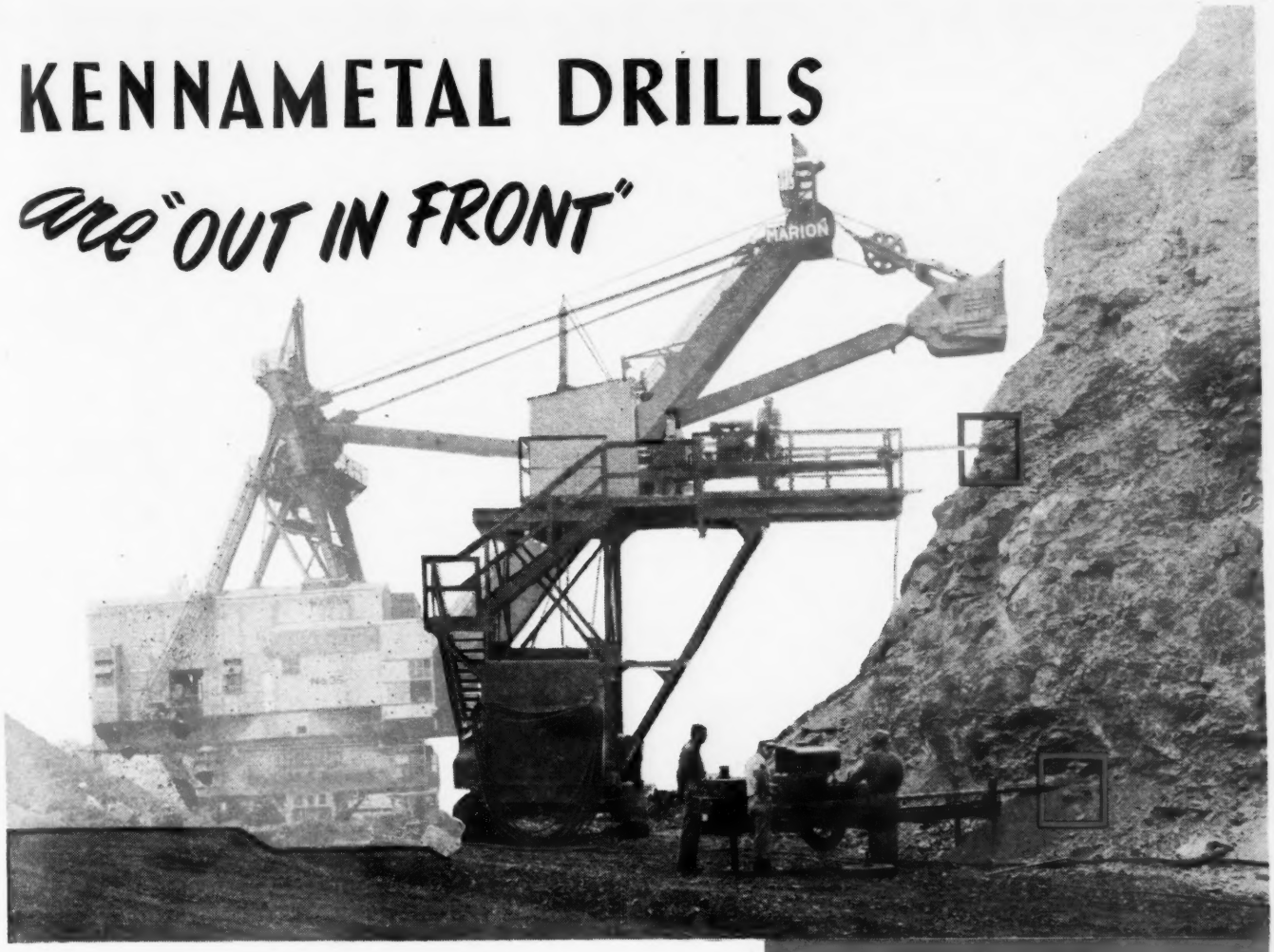
BUFFALO FORGE COMPANY
147 Mortimer St. Buffalo, N. Y.
Canadian Blower & Forge Co., Ltd., Kitchener, Ont.

"Buffalo"

FANS for MINE VENTILATION

KENNAMETAL DRILLS

are "OUT IN FRONT"



Before the shovel, the shot . . . before the shot, the hole . . . before the hole, the DRILL.

If it's a Kennametal Drill, results are outstanding—more holes, faster, better, cheaper.

You pay less for Kennametal-drilled holes, in time, in man-hours, in power, in bit replacement and resharpening.

If you're using these bits now, you will know what we mean. If you're not, the following typical field experience will be interesting:

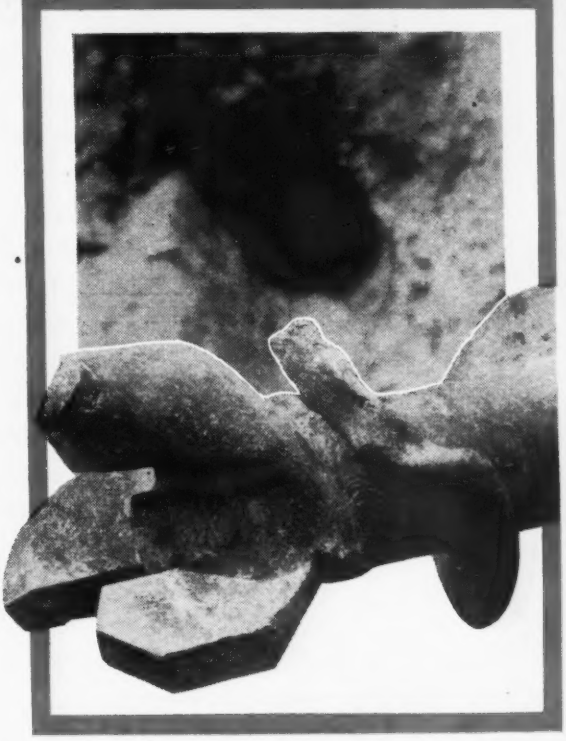
- In overburden consisting of hard shale matrix imbedded with large limestone nodules, a Kennametal 6½" diameter three-way bit put down 15 holes 60 feet deep in 390 minutes actual drilling time—an average of 26 minutes each (21 minimum, 35 maximum). After this 900 feet of drilling the bit was not dull enough to require resharpening!

Here are the reasons for such good service:

- These bits are revolutionary in type and design. They are *tipped with Kennametal,* the same hard, tough, durable cemented carbide that for years has produced outstanding results when used on metal-working tools.
- Cutting edges are scientifically contoured for fast drilling to accurate size throughout the bit life, including many regrinds. An effective core breaker helps to keep the hole clear and prevent bit stalling.
- Bodies are sturdy, heat-treated alloy steel castings having welded-in bar steel shanks, adaptable to fit common types of augers. Hexagonal type is standard, but square or splined can be furnished when ordered.

A small investment in Kennametal Drill Bits will help you realize the maximum returns from a large investment in shovel capacity for removing overburden in stripping operations.

Four sizes are available—3½", 4", 5", and 6½" diameters. Additional particulars, and prices, sent promptly upon request.



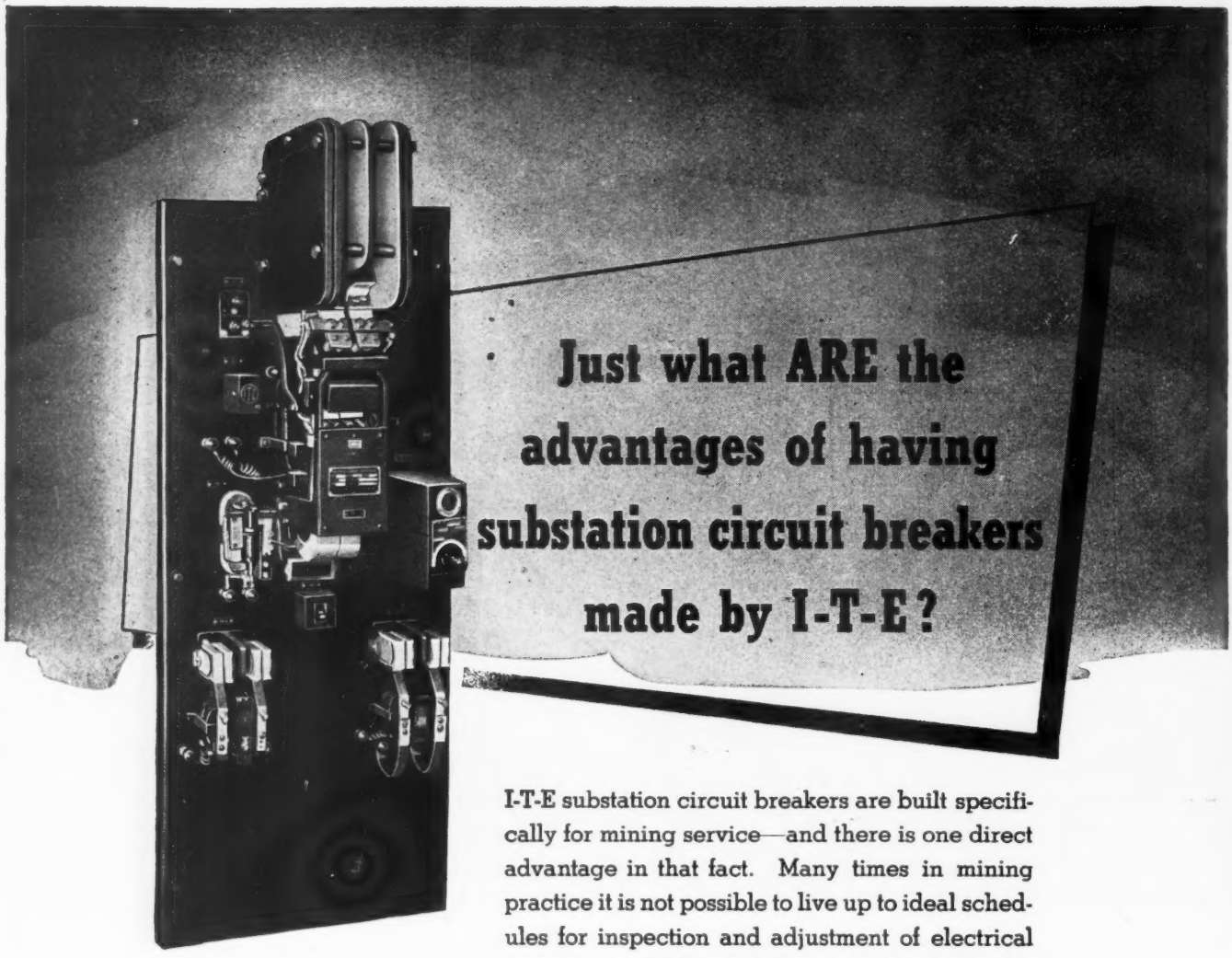
Photograph above shows excellent condition of Kennametal Rotary Drill Bit after being used for one month, drilling holes in customary Seam 8 overburden.

KENNAMETAL

SUPERIOR CEMENTED CARBIDES

TRADE MARK REG. U. S. PAT. OFF.

KENNAMETAL *Inc.*, LATROBE, PA.



Just what ARE the advantages of having substation circuit breakers made by I-T-E?

I-T-E substation circuit breakers are built specifically for mining service—and there is one direct advantage in that fact. Many times in mining practice it is not possible to live up to ideal schedules for inspection and adjustment of electrical equipment. I-T-E substation circuit breakers, for this reason, are so designed that they do the protective job they are bought for even though periodic inspection has been slighted and, as a consequence, control relays are not in perfect adjustment. Contacts do not freeze, and really serious trouble is rarely experienced.

The Type KSA circuit breaker, illustrated above, is for mining substation use. It protects semi-automatic or full-automatic motor generator sets, rotary converters or mercury-arc rectifiers. Its principal job is to reduce time losses resulting from disturbances on feeder circuits—and to remain in working condition so that it can perform whenever needed

In its work, Type KSA is a veteran. In producing and applying it, I-T-E has developed more experience with the protection of d-c circuits in mines than any other group. From the standpoint of mine operators, the Type KSA is an established device, well understood and readily accepted.

Let I-T-E engineers give you the details of the Type KSA, outlining its advantages against years of dependable diversified service.

I-T-E

Representatives in Principal Mining Areas

CIRCUIT BREAKER CO.,

PHILADELPHIA 30, PA.

RELIANCE Series C MOTORS

end your Lubrication Worries!

Say good-bye to bearing worries! Regardless of whether you over-grease or under-grease, Reliance's ball bearing design guarantees longer motor life.

Assured lubrication—without the care you must exercise with conventional motors—is a time-saving, money-saving reason for preferring Reliance Motors. Write today for Instruction Sheet 3042, which explains why the Reliance design needs no lubrication care.

RELIANCE ELECTRIC & ENGINEERING CO.

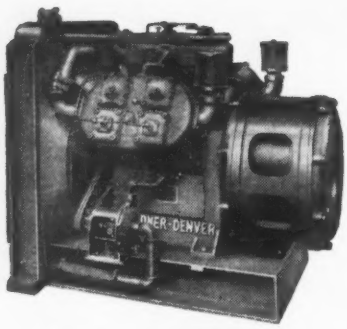
1055 Ivanhoe Road Cleveland 10, Ohio

Birmingham • Boston • Buffalo • Chicago • Cincinnati • Detroit • Greenville • Houston • Kalamazoo
Knoxville • Los Angeles • Minneapolis • New Orleans • New York • Philadelphia • Pittsburgh
Portland, Ore. • Rockford, Ill. • St. Louis • San Francisco • Seattle • Syracuse • Washington, D. C.

8 Balanced Design Features

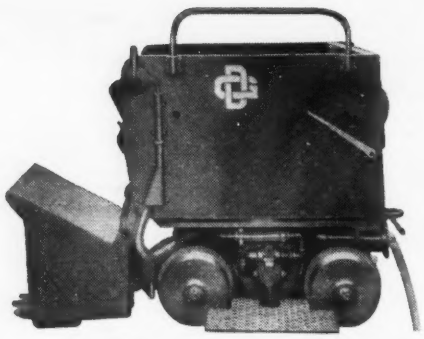
1. **Protecting enclosures** keep out dirt, chips, oil, excess moisture.
2. **Steel stators for strength.**
3. **Thirteen-step winding treatment,** for maximum stator protection.
4. **Pressure cast aluminum rotors** provide trouble-free windings.
5. **Heavy shafts,** liberally designed for added strength.
6. **Improved bearing lubrication** affords *real* protection to bearings and windings.
7. **Optional lead outlet arrangement** permits machine mounting with elimination of conduit box.
8. **Flange and face type brackets** offer alternative methods of machine application.

RELIANCE A-C D-C MOTORS



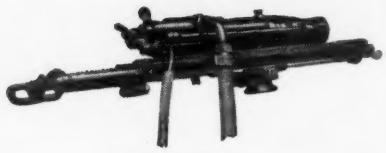
"WB" COMPRESSORS

Completely water-cooled. Delivers large air output for relatively small size. Easily moved from location to location.



MINE CAR LOADERS

The "big bite" loader whose famous fulcrum principle assures greater crowd, faster lift, and faster discharge and permits loading out more cars per man-hour.



DRIFTERS

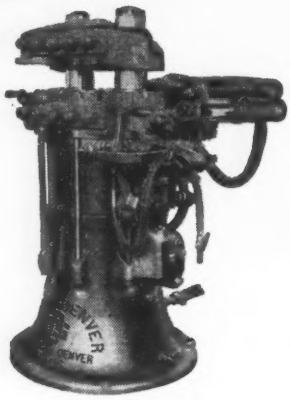
Automatic and hand feed drifters that assure highest drilling efficiency. Minimum vibration . . . lower maintenance.

TONNAGE BOOSTERS

YOU GET bigger tonnages . . . faster production . . . lower costs . . . with Gardner-Denver mining equipment on the job!

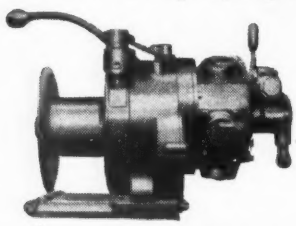
Wherever they are used, these "tonnage boosters" speed up the entire drilling, blasting, mucking cycle. They handle easily . . . reduce operator fatigue . . . permit more footage per shift. Maintenance and operating costs are exceptionally low.

Investigate the possibilities of Gardner-Denver mining equipment for your jobs. For complete information write Gardner-Denver Company, Quincy, Illinois.



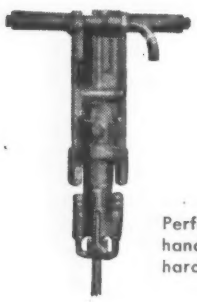
SHARPENERS

Provide sharp, properly formed cutting edge in minimum time. Constant-pressure air return speeds sharpening.



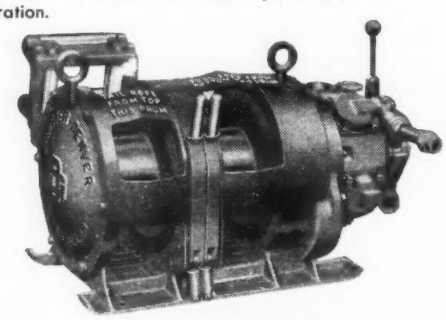
SINGLE DRUM HOISTS

Totally enclosed construction keeps dirt and water out—lubricant in. Fast, dependable operation.



SINKERS

Perfectly balanced for smooth, easy handling. Speed drilling even in hardest rock formations.



AIRSLUSHERS

Haul heavier loads, *faster*. Five cylinder air motor assures maximum power and speed in either direction.

STOPERS

That are preferred by drill runners everywhere. Easy handling . . . plenty of power.

GARDNER-DENVER
Since 1859

BRAND NEW!

"G-AY" MODEL DISSTON CHAIN SAW

with Mercury Gasoline Engine

MODEL G—37AY

MEASURED by every standard, this new Disston Chain Saw is one of the finest cutting tools ever to bear the Disston name. It is a result of exhaustive research by Disston engineers, plus constant study of the performance records of thousands of Disston Chain Saws, which are speeding up production and reducing timber-cutting costs in all parts of the country.

Though unchanged in principle, the new Disston Chain Saw has many improvements: added power and important new features . . . faster, steadier running . . . increased ease and economy of operation . . . greater sturdiness . . . easy to operate . . . etc.

Timbermen, sawmill owners, railroads, contractors, mine owners and other industries, are invited to investigate the merits of this truly remarkable saw and its applications to their particular needs. Mail coupon for full particulars.

OUTSTANDING NEW FEATURES

Air Cleaner to keep sawdust and dirt from engine and carburetor.

Fuel Filter (built in gasoline tank).

Die cast cooling fan.

Die cast cylinder, with increased number of fins, providing greater cooling area.

Reduction gear ratio of 3:1—Provides more efficient chain operating speed.

Positive multiple disc clutch, 13 plates.

Conveniently located throttle may be set in "open" position.

Muffler prevents exhaust from annoying operator.

Equipped with "L" pattern chains.

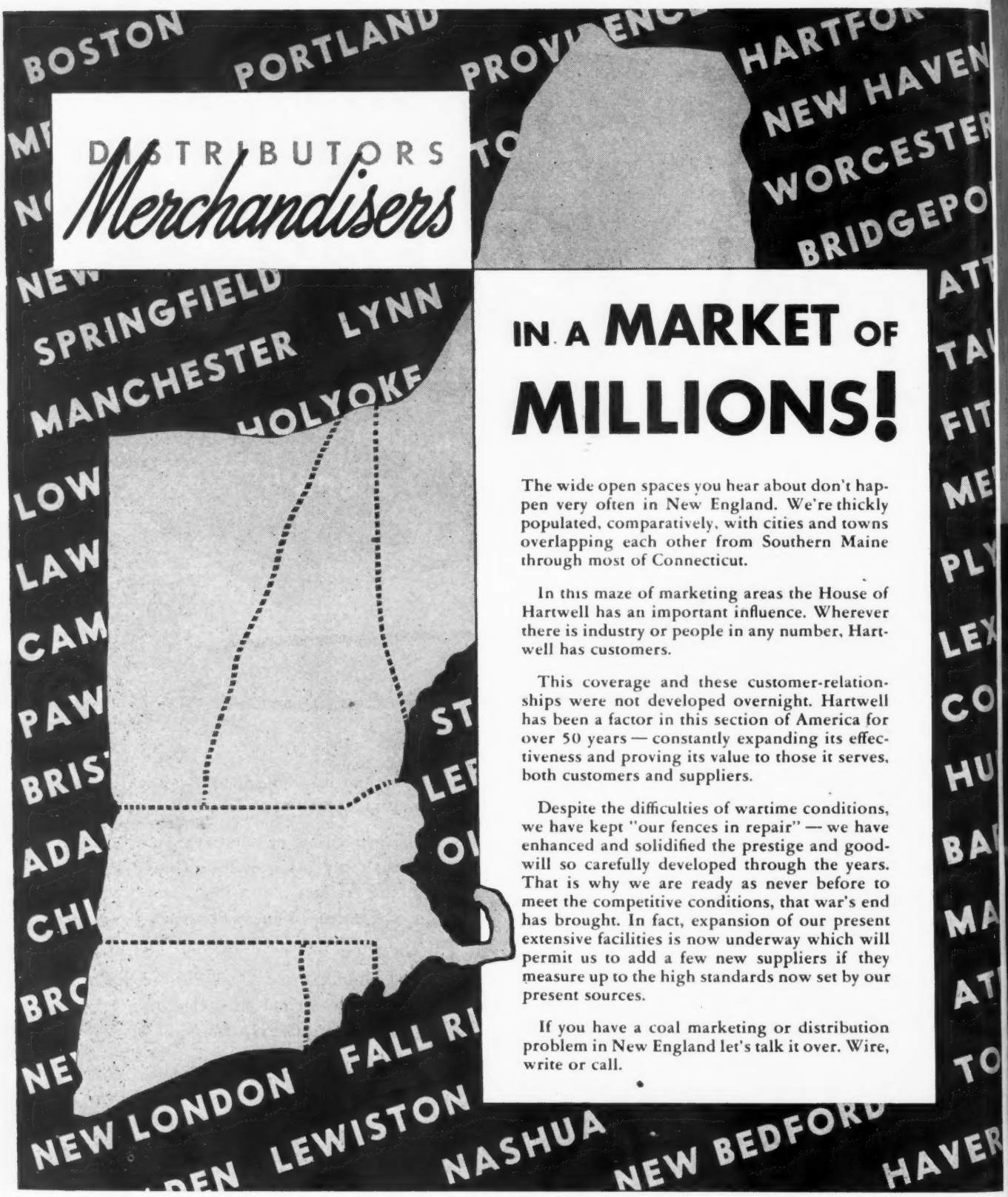
Equipped with 3-rib protection cradle underneath engine.

And others.

DISSTON CHAIN SAW
ALSO SUPPLIED WITH PNEUMATIC DRIVE

HENRY DISSTON & SONS, INC.
1042 Tacony, Philadelphia 35, Pa., U. S. A.
Please send me full particulars regarding Disston Chain Saws.
( ) with Mercury Gasoline Engine ( ) with pneumatic drive.
Your Name .....
Firm Name .....
Address .....

HENRY DISSTON & SONS, INC.
1042 Tacony, Philadelphia 35, Pa., U. S. A.



DISTRIBUTORS

Merchandisers

IN A MARKET OF MILLIONS!

The wide open spaces you hear about don't happen very often in New England. We're thickly populated, comparatively, with cities and towns overlapping each other from Southern Maine through most of Connecticut.

In this maze of marketing areas the House of Hartwell has an important influence. Wherever there is industry or people in any number, Hartwell has customers.

This coverage and these customer-relationships were not developed overnight. Hartwell has been a factor in this section of America for over 50 years — constantly expanding its effectiveness and proving its value to those it serves, both customers and suppliers.

Despite the difficulties of wartime conditions, we have kept "our fences in repair" — we have enhanced and solidified the prestige and goodwill so carefully developed through the years. That is why we are ready as never before to meet the competitive conditions, that war's end has brought. In fact, expansion of our present extensive facilities is now underway which will permit us to add a few new suppliers if they measure up to the high standards now set by our present sources.

If you have a coal marketing or distribution problem in New England let's talk it over. Wire, write or call.

H. N. HARTWELL & SON, Inc.

Member American Coal Sales Association

Dock Operators · COAL · Distributors

Park Square Bldg. BOSTON, MASS.

A FEW TIRED VALVES

CAN MAKE A WHOLE PLANT DOZE . . .

Worn-out valves at vital control points could make your entire plant lay down on the job. Valve failure is almost certain to interrupt work while repairs or replacements are made. Often it means ruin to materials in process. Sometimes, it brings serious danger to equipment and personnel.

Many valves which were nearing the retirement state before the war may now be dangerously close to complete collapse, as a result of carrying the abnormal service loads of wartime production. Trying to "revive" such valves is seldom worth the money and labor required.

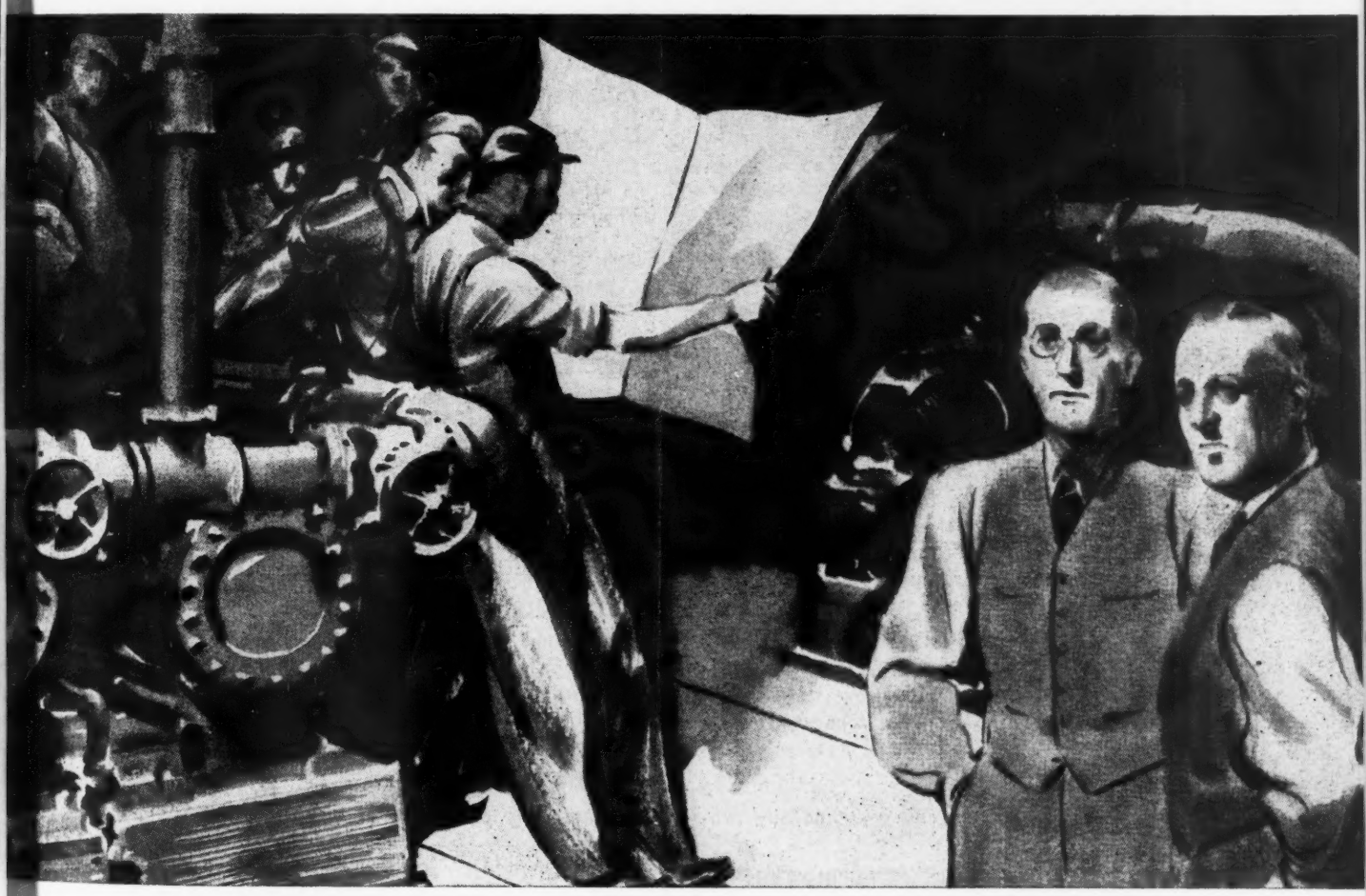
HOW TO SPOT "CRIPPLES" BEFORE THEY PUT YOU ON THE SPOT

Write for samples of the "Valve Record Sheets" prepared by Jenkins Engineers. Jot down the age and condition of every critical valve in your plant – its "trouble" record – and the cost of labor and parts for repairs. In this way you very quickly locate the points where new valves should be provided.

REPLACE WITH JENKINS VALVES . . . TO TAKE A LOAD OFF YOUR MIND . . . AND COST SHEET

For nearly a century Jenkins Valves have given dramatic demonstration of their low cost by remarkably long service records in thousands of installations throughout America. Jenkins Bros. better materials, better design, and better workmanship have always made a better valve. Over 600 patterns for every service are shown in the Jenkins Catalog.

Jenkins Bros., 80 White Street, New York 13; Bridgeport, Conn.; Atlanta, Boston, Philadelphia, Chicago, San Francisco. Jenkins Bros., Ltd., Montreal, London.



LOOK FOR THIS JENKINS DIAMOND MARK

Jenkins Bros

JENKINS VALVES

SINCE 1864

For every Industrial, Engineering, Marine, Plumbing-heating Service . . . In Bronze, Iron, Cast Steel and Corrosion-resisting Alloys . . . 125 to 600 lbs. pressure.

Sold Through Reliable Industrial Distributors Everywhere

JENKINS BROS., 80 White St., New York 13, N. Y.

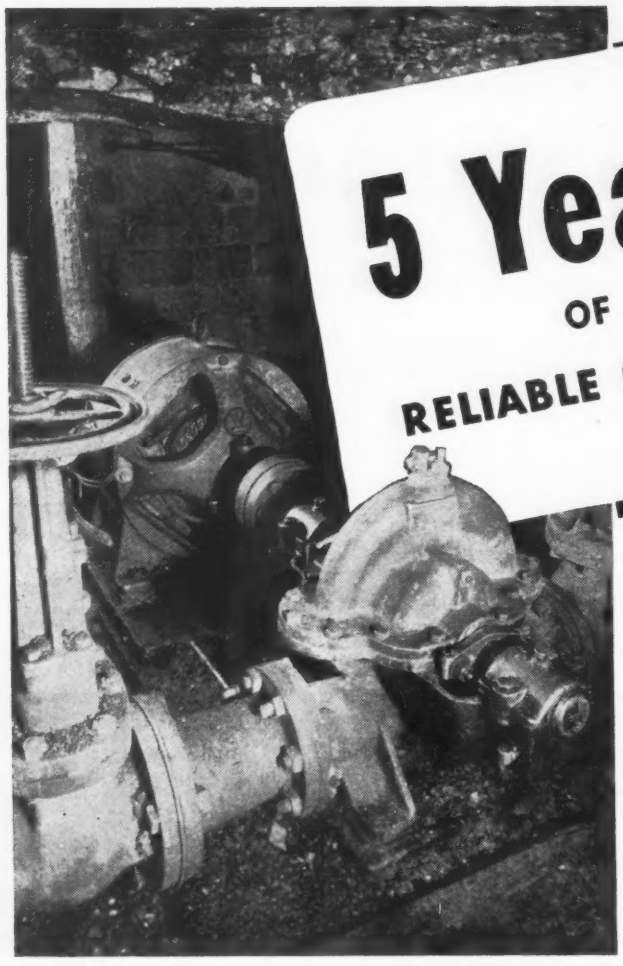
Please send me a set of the Jenkins "Valve Record Sheets"

Name.....

Company.....

Address.....

.....



5 Years OF RELIABLE SERVICE

and

NO MAINTENANCE *for this* 1000 G.P.M.

WARREN PUMP

"Our Warren 1000 G.P.M. pump was installed five years ago, and handling very acidulous water, has operated to date with no expense for maintenance or repairs," writes the superintendent of a well-known bituminous coal company. "Its present condition is excellent and we do not hesitate to recommend Warren Pumps highly for dependability and low operating and maintenance costs."

AND HERE ARE SOME OF THE REASONS WHY USERS RECOMMEND WARREN PUMPS:

CORRECT MATERIALS

Standard Warren Pumps have iron casings with bronze impellers, shaft sleeves, case rings, and glands. Pumps can be furnished with all parts coming in contact with liquids made of acid-resisting bronze or chrome steel alloy.

SMOOTH PERFORMANCE

Impellers are accurately balanced, insuring vibration-free performance. Shafts are finished by grinding and made exceptionally heavy to prevent deflection.

NON-CLOGGING

Water passages are correctly and liberally proportioned to handle suspended solids without trouble.

LONGER LIFE

Low velocities mean less wear on casings.

REDUCED MAINTENANCE

Bearings are of the split shell, heavy duty, ring-oiling type or full ball bearing. Labyrinth case wearing rings; water-sealed, deep stuffing boxes and split packing glands are used.

GREATER ACCESSIBILITY

All interior parts are readily accessible without disturbing piping.

Warren Pumps installed on de-watering services in the bituminous fields of Pennsylvania and West Virginia alone are discharging to the surface approximately 75,000,000 gallons of water per day on heads varying up to 500 feet. Follow the example of many Warren-equipped mines and take advantage of the savings Warren Pumps make possible.

FOR LONGER LIFE AND GREATER DEPENDABILITY

WARREN STEAM PUMP CO., INC.

WARREN, MASSACHUSETTS

It's as simple as that!

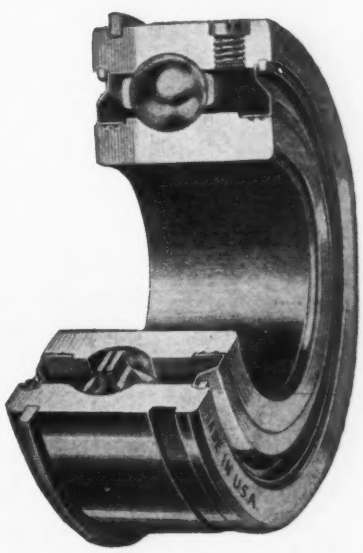
If it's a gun, you simply open the breech—insert the shell or cartridge—close the breech—and you're ready to fire.

If it's a motor or machine, you just slip the "CARTRIDGE" BEARING into its housing—assemble the housing—and you're ready for operation.

Yes—the "CARTRIDGE" BEARING is as complete and self-contained, functionally, as a rifle cartridge or gun shell—fully charged, at the factory, with a heavy load of NORMA "STABILITY-TESTED" GREASE; self-sealed against loss of lubricant or intrusion of dirt.

No fussy fitting—no loose parts—no messy grease "plumbing"—no chance for looseness—no running dry, no wear—

It's as simple as that!

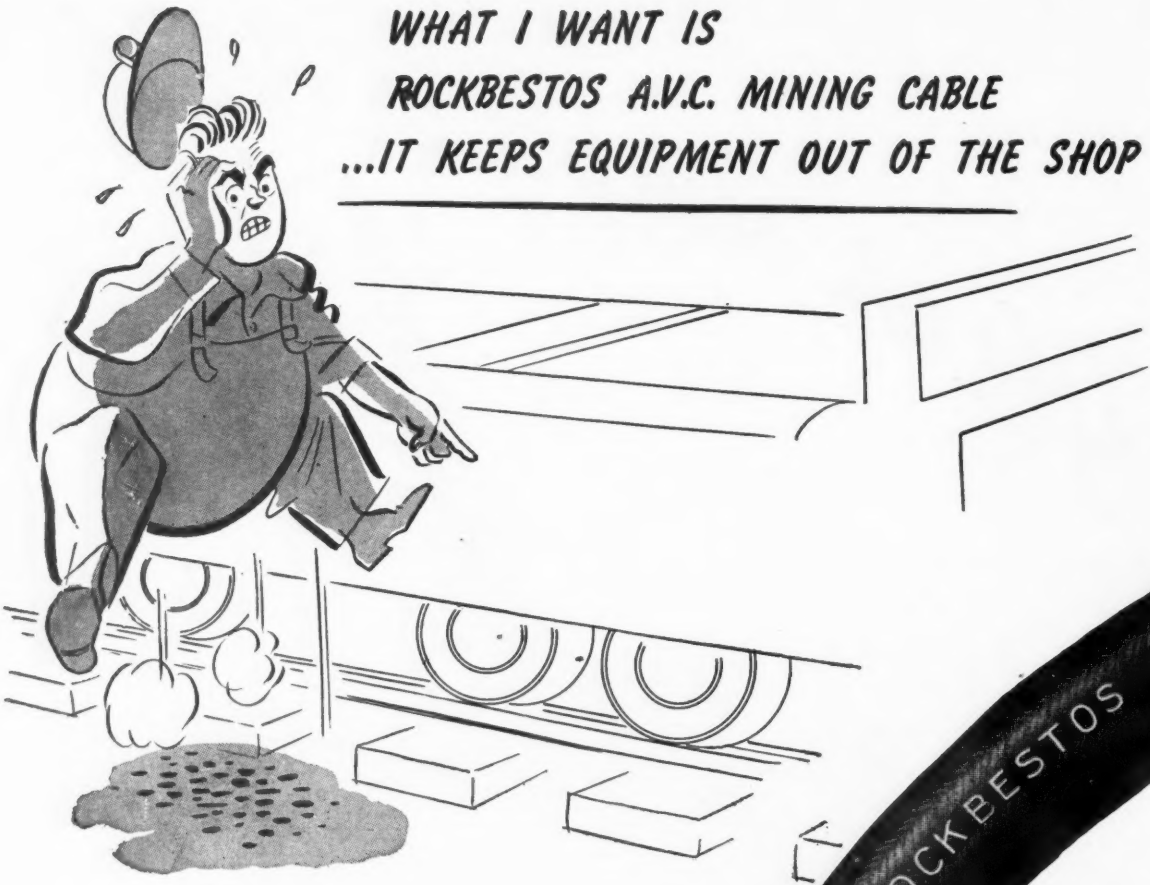


PATENTED

NORMA-HOFFMANN BEARINGS CORP'N. STAMFORD, CONN. *Founded* 1911

Field Offices: NEW YORK • CHICAGO • CLEVELAND • CINCINNATI • PITTSBURGH • DETROIT • LOS ANGELES • SAN FRANCISCO • SEATTLE, WASH.

WHAT I WANT IS ROCKBESTOS A.V.C. MINING CABLE ...IT KEEPS EQUIPMENT OUT OF THE SHOP



Put new life into your war-worn cutters, loaders and locomotives by rewiring motor leads, coil connections and connections between controllers and resistors with Rockbestos A.V.C., the mining cable that's built to take heat and won't rot or bloom when in contact with oil or grease.

Mine electricians who have standardized on Rockbestos A.V.C. Mining Cable know that it takes the heat of overloads and resistors without baking brittle, cracking or flowing and that it won't burn or carry flame. Mine superintendents know that it greatly reduces electrical maintenance. And leading equipment manufacturers know that it was designed for mining machines in 1928 and that it has been practically eliminating cable-failures ever since.

For samples and literature write to the nearest jobber listed below or:

THE ORIGINAL ROCKBESTOS A.V.C. CONSTRUCTION

1 Heatproof, fireproof, rugged impregnated asbestos yarn braid resistant to moisture, oil, grease, and alkalies and diametered to fit bushings properly.

2 Felted asbestos insulation, impregnated with heat, flame and moisture resistant compounds like the braid, will not dry out, bake brittle, crack, flow or burn — a real barrier against the destruction caused by heat and travelling wire-fires.

3 Lubricated varnished cambric for high dielectric strength and added moisture resistance — protected from heat, flame and oxidation by two felted asbestos walls.

4 Inner felted asbestos insulating wall, also impregnated with heat, flame and moisture resisting compounds, withstands conductor-heating overloads and won't bake brittle or burn.

5 Paper separator to make stripping easy and prevent the insulation from sticking to the conductor.

6 Flexible tinned copper conductor, perfectly and permanently centered in helically applied non-flowing insulation.

This construction is one of 125 developed for severe or unusual operating conditions by Rockbestos.

ROCKBESTOS PRODUCTS CORPORATION
P. O. Drawer 1102, New Haven 4, Conn.

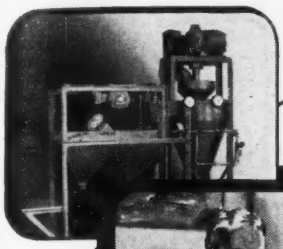
ROCKBESTOS A.V.C. *The Cable with Permanent Insulation*

ORDER FROM THESE JOBBERS—SPECIFY "ROCKBESTOS A.V.C."

BECKLEY, W. VA.:	Beckley Mach. & Elec. Co.	EVANSVILLE, IND.:	Evansville Elec & Mfg. Co.	PITTSBURGH, PA.:	Upson-Walton Co.
BIRMINGHAM, ALA.:	Moore-Handley Hdwe. Co.	FAIRMONT, W. VA.:	Fairmont Supply Co.		Westinghouse Elec. Supply Co.
BLUEFIELD, W. VA.:	Superior-Sterling Co.	HUNTINGTON, W. VA.:	Banks-Miller Supply Co.	SCRANTON, PA.:	Penn. Elec. Engineering Co.
CHARLESTON, W.VA.:	Charleston Elec. Supply Co.	LOTHAIR, KY.:	Mine Service Co.	WHEELING, W. VA.:	Westinghouse Elec. Supply Co.
CLEVELAND, OHIO:	Upson-Walton Co.	MIDDLEBORO, KY.:	Rogan & Rogan Co.	WILLIAMSON, W.VA.:	Williamson Supply Co.

INVEST IN U. S. VICTORY BONDS

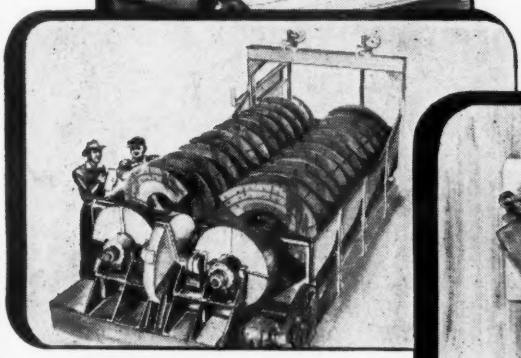
You GET BETTER RESULTS FROM Wemco H.M.S. EQUIPMENT



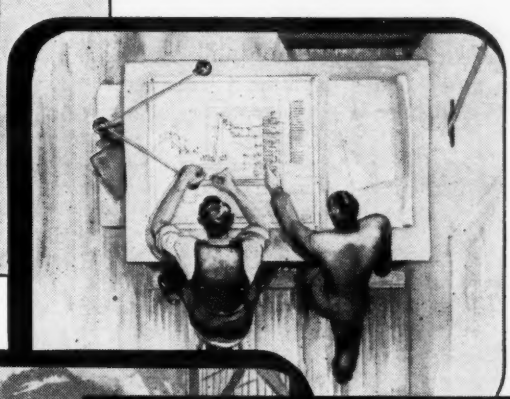
RESEARCH

PLANNING

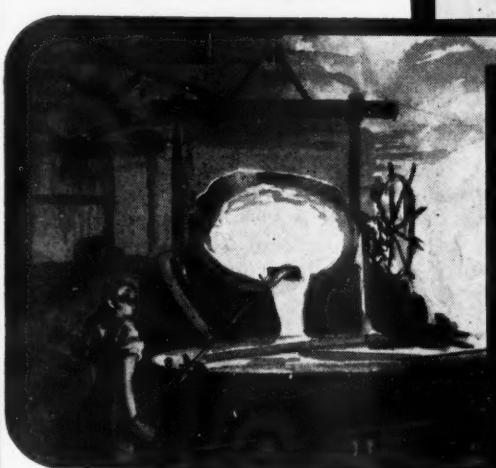
BECAUSE OF THE KNOW-HOW GAINED IN THE IMPLEMENTING OF MORE HEAVY MEDIA SEPARATION PLANTS THAN ANY OTHER MANUFACTURER AND IN THE DEVELOPMENT OF MACHINERY CONSTRUCTED ESPECIALLY FOR H. M. S.



FIELD WORK



ENGINEERING



PRODUCTION

WEMCO

WESTERN MACHINERY COMPANY

760 FOLSOM STREET, SAN FRANCISCO 7, CALIFORNIA

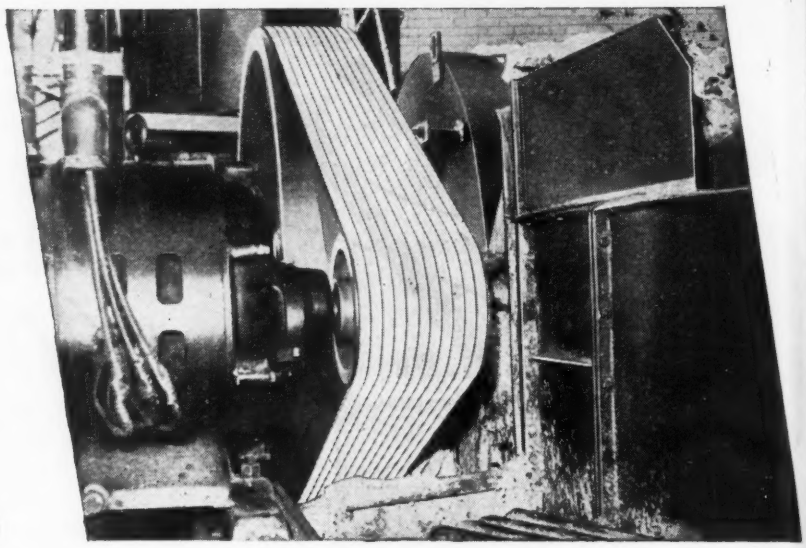
LOS ANGELES • SACRAMENTO • SPOKANE • SALT LAKE CITY • PHOENIX • DENVER • NEW YORK • WASHINGTON, D.C.

AGITATORS • SAND AND DIAPHRAGM PUMPS • FEEDERS • CLASSIFIERS
HYDROSEPARATORS • THICKENERS • TABLES • H M S EQUIPMENT

HMS EQUIPMENT BY WEMCO:

- SEPARATORY SCREWS
- SEPARATORY CONES
- DENSIFIERS
- SPECIAL THICKENERS
- MAGNETIZING BLOCKS
- GLANDLESS SAND PUMPS
- SOLENOID GATES
- SPECIAL MEDIA SEPARATING HOPPERS
- 20" HMS LABORATORY UNIT

Today-



Your *Standard*
GATES VULCO ROPES

are giving BETTER SERVICE than ANY V-Belts EVER Built Before the War!

To meet the unprecedented severity of combat service on U. S. Army tanks, tractors and self-propelled big guns, Gates developed and built V-Belts *far superior* to any that were ever built before--and here is why this fact is important to YOU:—

✔ **Every improvement developed by Gates for these Army V-BELTS has been added, day by day, to the quality of the standard Gates Vulco Ropes which have been delivered to you.**

You have not had to wait until after the war for these improvements for the simple reason that more efficient V-Belts have been an important factor in increasing essential war production. That is why your standard Gates Vulco Ropes are today the best V-Belts that have ever been delivered to you.

In addition, where V-Belts of special construction are required, your Gates Rubber Engineer is in position to supply a Gates Vulco Rope that is especially engineered to meet your special needs. You need only pick up your phone book and look under the heading "Gates Rubber." The Gates Rubber Engineer will bring to you, right in your own plant, the very latest advances in V-Belt construction and in drive operation as well.

and NOTE THIS:—

Gates also makes these special belts to meet exceptional service needs.

Rayon Cord V-Belts
Static-Safety V-Belts
***Special* Synthetic V-Belts**
Cotton Cord V-Belts
Steel Cable V-Belts

All Gates V-Belts are Built With *The Patented* CONCAVE SIDE

Gates — THE MARK OF SPECIALIZED RESEARCH

THE GATES RUBBER COMPANY

Engineering Offices and Jobber Stocks in All Large Industrial Centers

4510

GATES VULCO ROPE DRIVES

CHICAGO 6, ILL., 549 West Washington. NEW YORK CITY 3, 215-219 Fourth Avenue. ATLANTA 3, GA., 521 C. & S. Nat'l Bank Bldg.
LOS ANGELES 21, CAL., 2240 E. Washington Blvd. DENVER 17, COLO., 999 S. Broadway. DETROIT 2, MICH. 223 Boulevard Bldg.
PORTLAND 9, ORE., 333 N.W. 5th Ave. DALLAS 2, TEXAS, 1710 N. Market St. SAN FRANCISCO 3, CAL., 170 Ninth St.

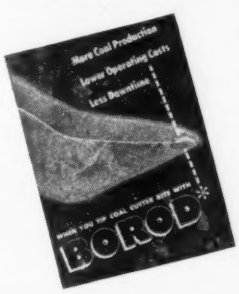
HERE ARE BOROD SAVINGS in a nutshell

Read this report from a large Pennsylvania mine:

"We make big savings by using Borod to tip cutting machine bits. Before using Borod, we replaced 700 to 800 bits per shift when working but 15 places underground. Now we need an average of only 20 bits per shift and are working 40 places!"

Only 8/1,000 of an ounce of Borod multiplies life of this bit 8 times!

BOROD is a Stoody hard-facing rod composed of small tungsten carbide particles in mild steel tubes. An added flux assures smoothness of deposits and ease of application. Borod will not "ball up"; may be applied thinly by oxy-acetylene torch, saving material and welding time. Used by large mines from coast to coast for maintaining sharpness and increasing life of coal cutter bits and other wearing equipment. BOROD *cuts tonnage costs, reduces equipment wear, saves downtime! Sold through 600 U.S. distributors—try 5 lbs. today!*



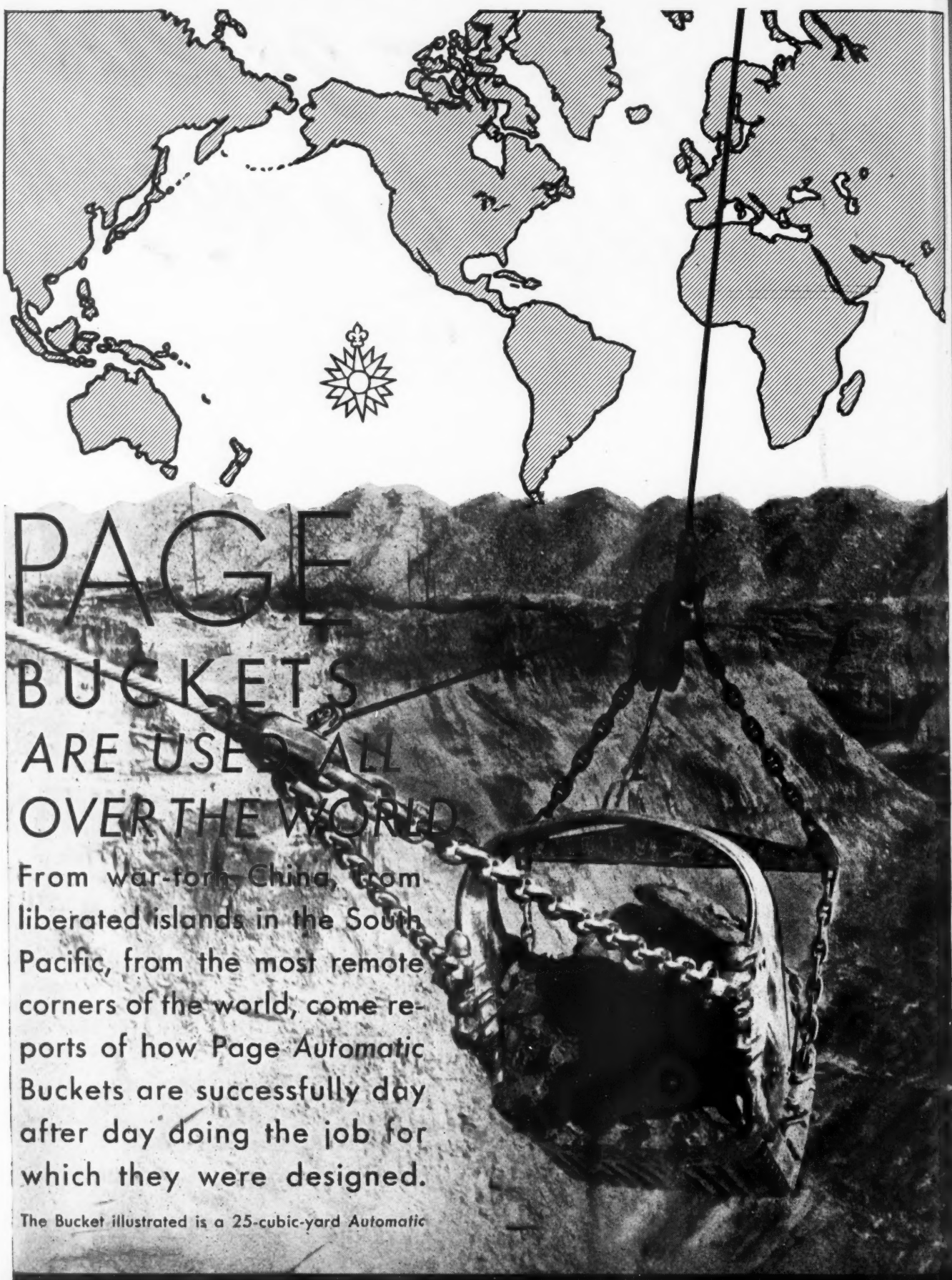
STOODY COMPANY

1143 WEST SLAUSON AVENUE • WHITTIER, CALIFORNIA

Write for the complete Borod facts—a bulletin giving costs, savings and application information will be mailed promptly.

STOODY HARD-FACING ALLOYS

Retard Wear **Save Repair**



PAGE BUCKETS ARE USED ALL OVER THE WORLD

From war-torn China, from liberated islands in the South Pacific, from the most remote corners of the world, come reports of how Page *Automatic* Buckets are successfully day after day doing the job for which they were designed.

The Bucket illustrated is a 25-cubic-yard *Automatic*

PAGE ENGINEERING COMPANY, CHICAGO 38, ILLINOIS

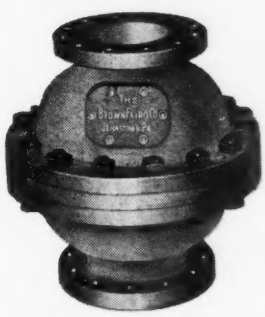
THE AUSTIN-BROWNIE PERFECT OILER PUMP

FOR TOUGH GATHERING JOBS

High heads, acid water, silt, long suction lines, pumping water from several sumps, handling air and water alternately — these are conditions under which Austin Pumps have been working successfully for over twenty-five years.

Austin-Brownie Perfect Oiler Pumps are made in four sizes, rated from 35 to 100 g.p.m., and for heads up to 250 ft. Water cylinders are of cast iron bronze fitted, all high lead acid resisting bronze, or chrome iron.

The 6x6 pump illustrated is mounted on a sled type base with V belt drive between motor and counter-shaft. The power frame is fully enclosed, equipped with anti-friction bearings, and all working parts are oil bath lubricated. Overall dimensions height 28½", width of base 27", length 8' 9".



8" CHECK VALVE

Check and Foot Valves are made in a complete range of sizes, and are of suitable materials to resist the action of acid water. Multiport construction reduces back flow and water hammer.

For Conditions that Lick Ordinary Pumps
Specify Austin-Brownie

OTHER BROWN-FAYRO SPECIALTIES

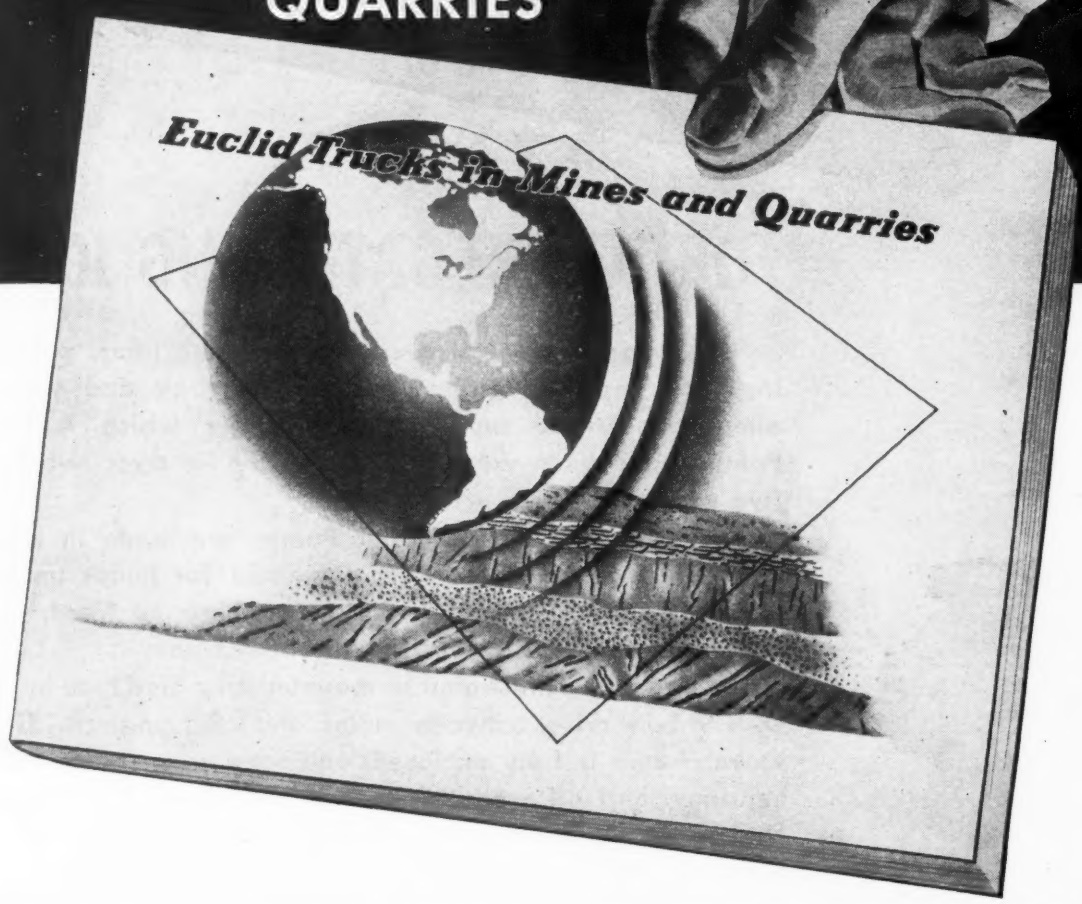
BLOWERS • MINE CARS • CAR SPOTTERS • RERAILERS
RETARDERS and WHEELS • HOISTS • SHEAVES

THE BROWN-FAYRO COMPANY
JOHNSTOWN, PENNA

HERE'S AN INTERESTING BOOK ON

TRUCK HAULAGE

IN MINES AND QUARRIES



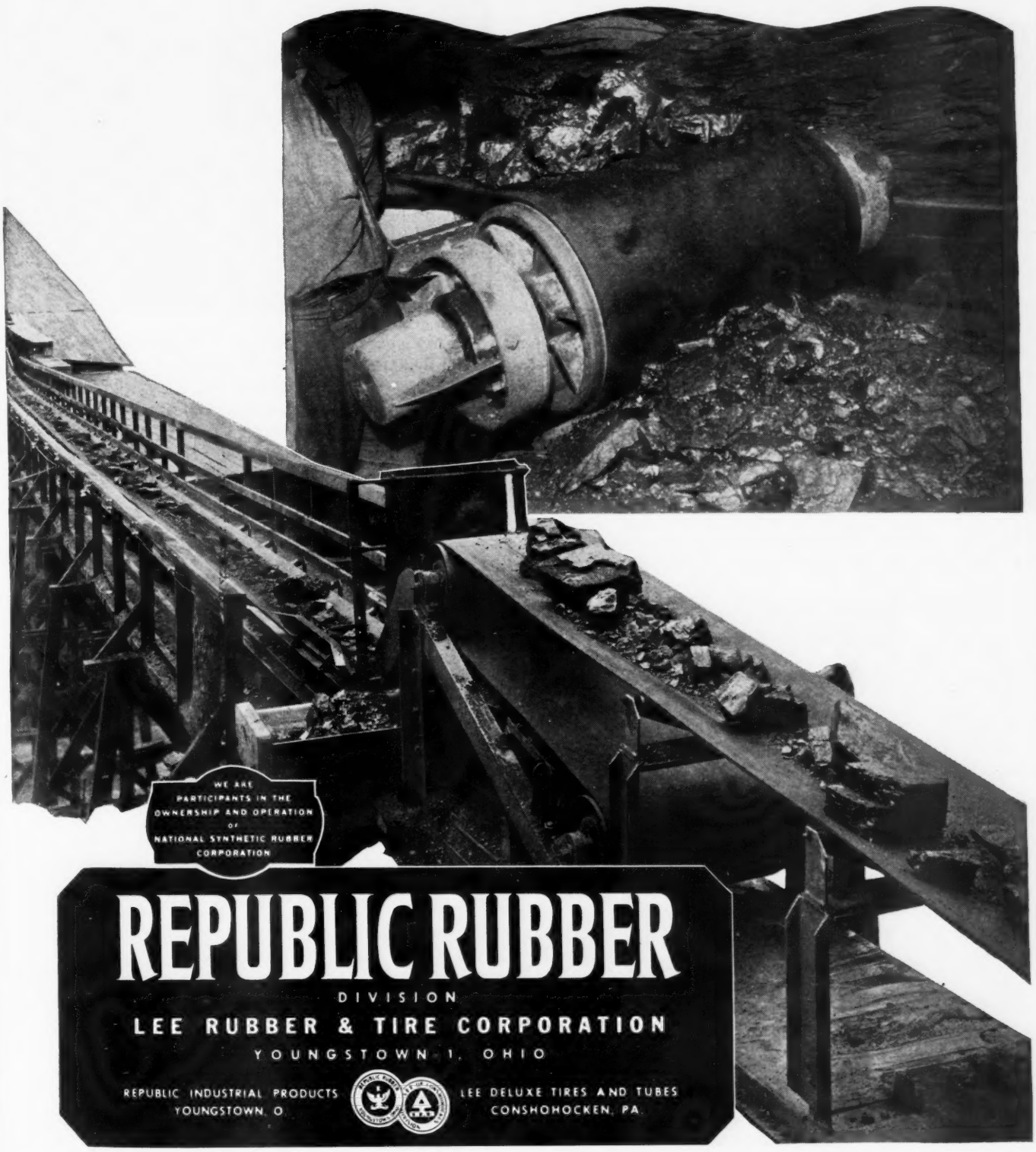
● For facts and figures on typical applications of Rear-Dump and Bottom-Dump EUCLIDS in mines and quarries, get your copy of this 32-page book. Profusely illustrated with full color and black and white on-the-job pictures, it shows how leading operators are using Euclids for overburden, ore and stone haulage on many kinds of open pit operations.

You will find this book of special interest because of the information and variety of jobs illustrated. It may be helpful in suggesting ways to increase production and lower *your* hauling costs. There is no obligation, of course, so ask your Euclid distributor or representative for your copy, or write us direct . . . on your letterhead, please.

The EUCLID ROAD MACHINERY Co. · · · Cleveland 17, Ohio

Republic Conveyor Belts ARE BUILT TO WITHSTAND Severe PUNISHMENT

●● Where large size coal, ore or rock is conveyed, a belt must be specifically engineered to withstand impact and cutting as well as to handle sustained loads. Republic technologists have studied the requirements of mining installations and have designed two conveyor belts for this heavy-duty service—Super Excelo Reprene and Record Maker-S. On primary conveyors and underground installations, as well as for cleaning plant and refuse conveyors, these Republic Belts will give long, economical service. Consult your Republic Distributor on the correct belt for your tough conveyor installations.



WE ARE PARTICIPANTS IN THE OWNERSHIP AND OPERATION OF NATIONAL SYNTHETIC RUBBER CORPORATION

REPUBLIC RUBBER

DIVISION

LEE RUBBER & TIRE CORPORATION

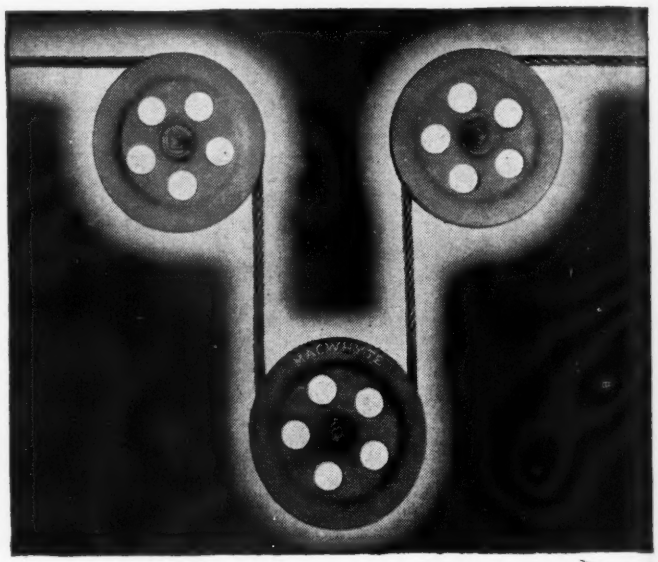
YOUNGSTOWN 1, OHIO

REPUBLIC INDUSTRIAL PRODUCTS YOUNGSTOWN, O.

LEE DELUXE TIRES AND TUBES CONSHOHOCKEN, PA.

Recommended for these extra-tough jobs!

MACWHYTE PREformed WIRE ROPE



Macwhyte PREformed Wire Rope gives excellent service on the following installations:

EXCAVATING:

Load Lines on all types of portable excavating machinery such as:
Shovels
Clamshell Cranes
Pull Stroke Shovels
Draglines
Backfillers
Pile Drivers
Scrapers—Scraper Loaders

MINING:

Hoist, Slope, or Incline Ropes
Mining machine ropes
Non-spinning ropes for shaft sinking and shaft hoists

DRILLING:

Rotary oil well drilling lines

QUARRYING:

Derrick Main Falls
Whip Ropes
Slings

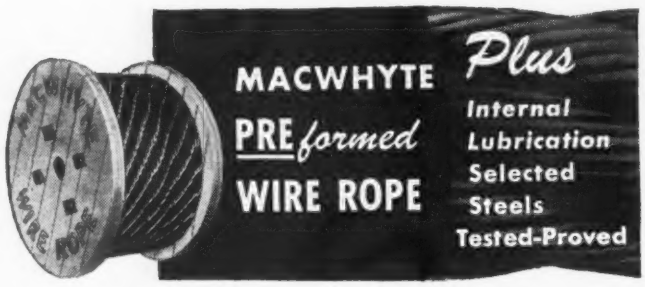
LOGGING:

Choker Ropes
Haulback Lines
Main Lines
Skidding Lines
Receding Lines
Loading Lines

GENERAL:

All Lang Lay Ropes
All 18 x 7 Kilindo Non-rotating Ropes
Elevator Ropes
Industrial Ropes

Send for booklet 43-85 "Wire Rope Conservation Bulletins" illustrating and describing many factors affecting wire rope service.



The correct rope for your equipment

Twenty years of service has proved that because it is more flexible, Macwhyte PREformed Wire Rope gives superior service on equipment requiring a great amount of bending over sheaves, particularly at high speeds. Macwhyte PREformed also stands up better under heavy loading and continuous operation.

Because it lasts longer, Macwhyte PREformed costs less in the long run.

HERE'S WHY Macwhyte PREformed lasts longer. Each wire and strand is PREformed to the exact helical shape it assumes in the finished rope. This reduces internal stresses, greatly increases flexibility.

Macwhyte PREformed is Internally Lubricated

Every wire in every strand of Macwhyte PREformed Wire Rope is coated with Macwhyte Internal Lubricant to improve the sliding action of the wires as they move in bending around sheaves and drums.

MACWHYTE COMPANY

Wire Rope Manufacturers

No. 804

2931 FOURTEENTH AVENUE KENOSHA, WISCONSIN

Mill Depots: New York • Pittsburgh • Chicago • Fort Worth • Portland • Seattle • San Francisco. Distributors throughout the U.S.A.

MACWHYTE PREformed and Internally Lubricated Wire Rope
MONARCH WHYTE STRAND Wire Rope
MACWHYTE Special Traction Elevator Rope
MACWHYTE Braided Wire Rope Slings
MACWHYTE Aircraft Cables and Tie-Rods
MACWHYTE Stainless Steel Wire Rope
MACWHYTE Monel Metal Wire Rope

The Rocky Road to Dublin

was a cinch compared to this!

There's no silky six-lane highway where this Mack earns its keep. One of seven Mack Trucks working in the stripping pits of the Coal Rains Coal Company, it leads a rough-and-tumble life.

It's *smash!* . . . as ten tons of coal are dumped into the waiting truck. It's twist and strain and scramble over the ridges and through the ruts. Then 2,000 feet up a steep ramp—two miles more to the breaker. Then back—and over again. Two shifts a day. Six days a week.

Macks show what they're made of on battering jobs like this. They stand up and take it smiling. Why not make your next truck a Mack, and see what performance a really tough truck can deliver?

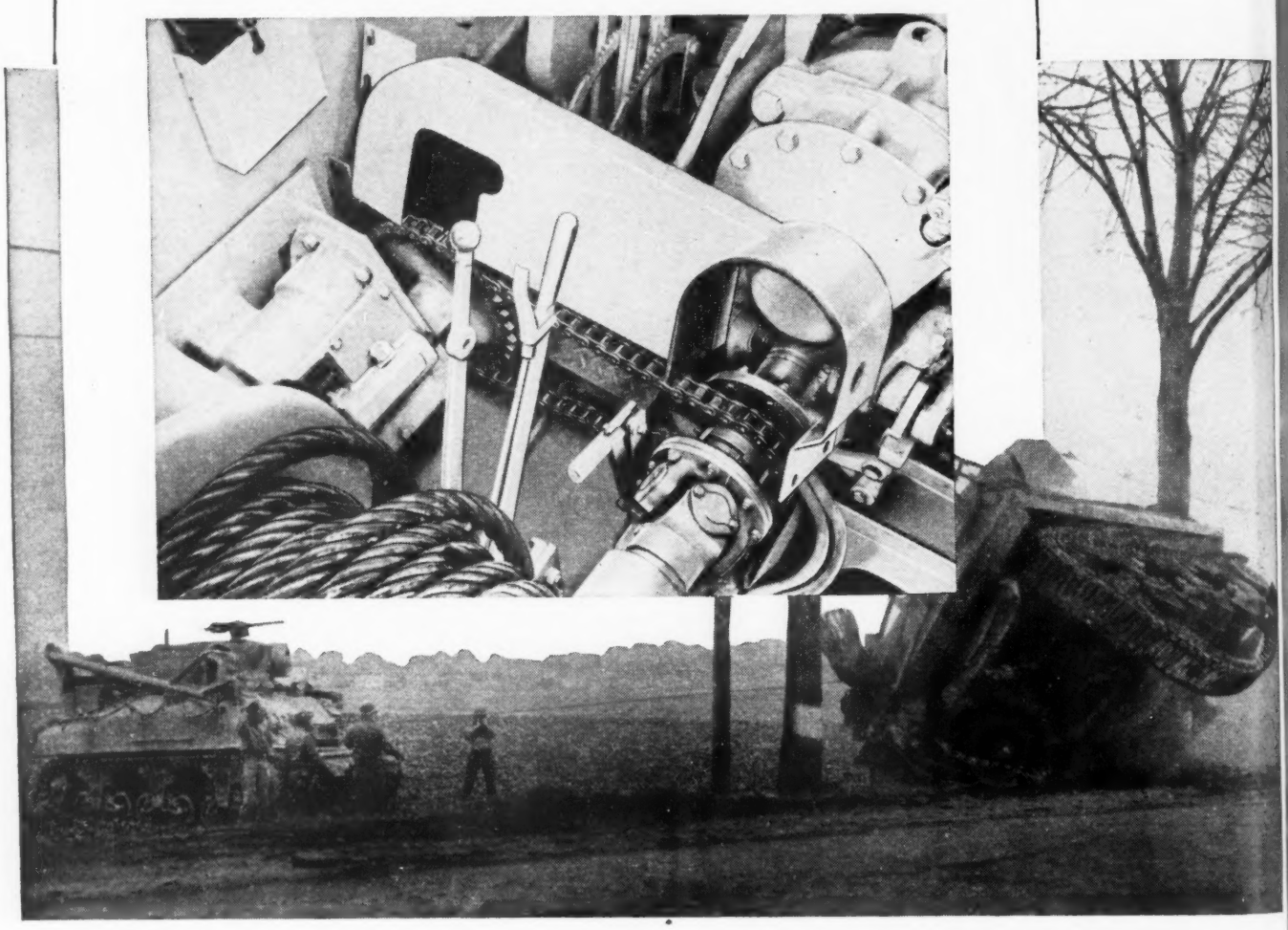
★ Buy That Victory Bond Today ★

Mack Trucks, Inc., Empire State Building, New York City. Factories at Allentown, Pa.; Plainfield, N. J.; New Brunswick, N. J.; Long Island City, N. Y. Factory branches and dealers in all principal cities for service and parts.

Mack
TRUCKS
FOR EVERY PURPOSE
ONE TON TO FORTY-FIVE TONS

Performance Counts!

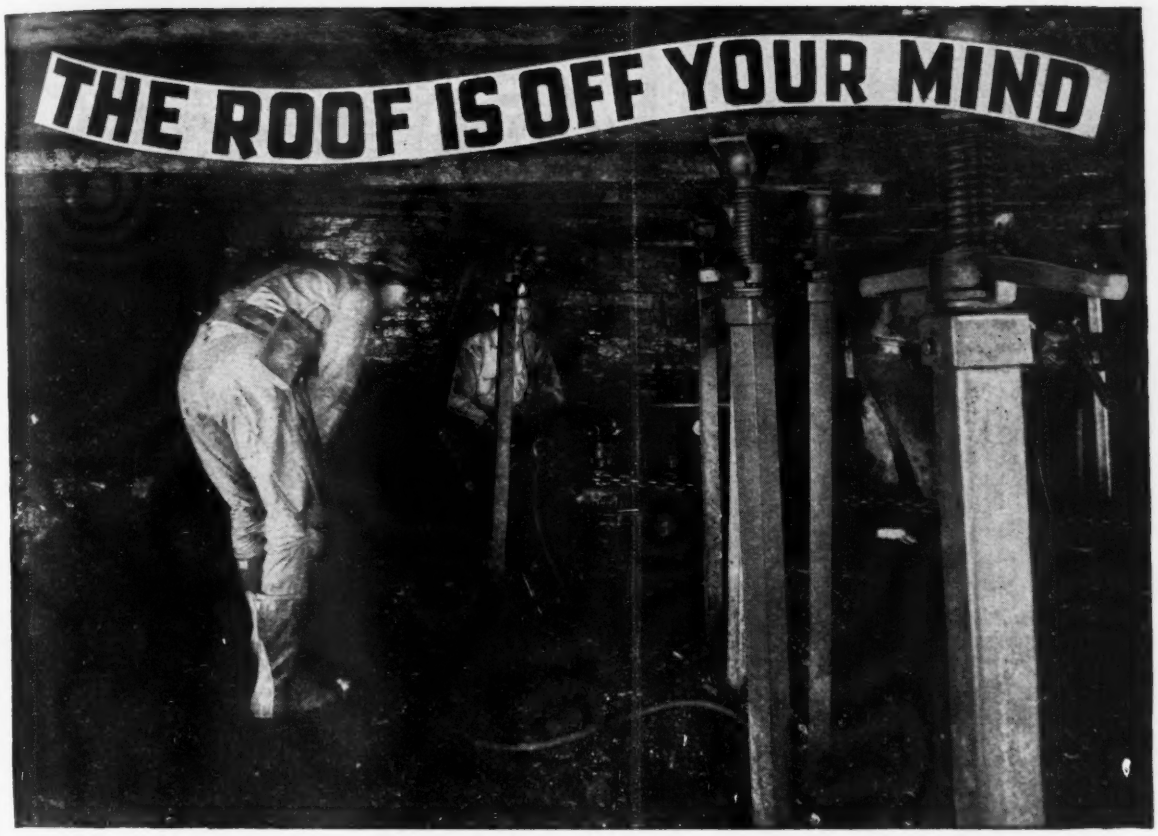
WHITNEY
ROLLER CHAINS
Are Helping to Finish the Job



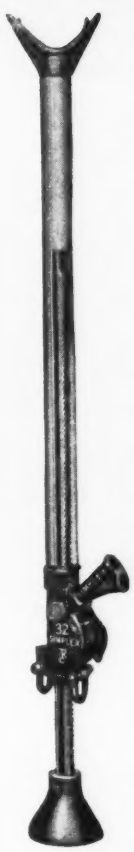
Whitney-equipped tank recovery unit pulling a burnt-out German tank off the road near Karpen, Germany.

Whitney Roller Chains, still pulling for victory on every remaining battle front, are assuming their well-earned position in post-war planning. Built with *precision* parts, accurately joined, Whitney Roller Chains insure powerful, positive drive — delivery of full rated machine capacity. For uninterrupted top performance, plan to equip *all* your production machines with Whitney Roller Chain drives. Write for catalog.

The WHITNEY CHAIN & MFG. CO., Hartford 2, Connecticut



Simplex Mine Roof Jacks at the Wallace Mine of the Youghiogheny & Ohio Coal Company, one of the many progressive mining companies that play safe with Simplex Jacks.



Simplex No. 32 Combination Mine Timber Jack and Post Puller. Ratchet Lever Type; 5-ton Capacity.

....*when* Simplex Jacks *are in place*....

Simplex (the original) Mine Roof Jacks have maintained their leadership through the years because they provide maximum safety, combined with important savings of time and labor in their installation.

M8 (8-ton capacity) and M16 (16 tons) Mine Roof Jacks are easily and quickly set in place where tender draw slate or other soft tops present a hazardous roof problem. The working face is better protected by these speedy, inexpensive jacks. They are also widely used as temporary supports under cross timbers, steel beams or steel rails, and for holding conveyors in place. They allow loading machines and conveyors to work in less space. Painted aluminum color for better visability. M8 and M16 are available with heads for any type of roof supporting member and are furnished with square tubing. M9 and M17 consist of screw assembly and base only for your own round pipe. Send for Catalog No. 44.

TEMPLETON, KENLY & CO.,
CHICAGO (44), ILLINOIS

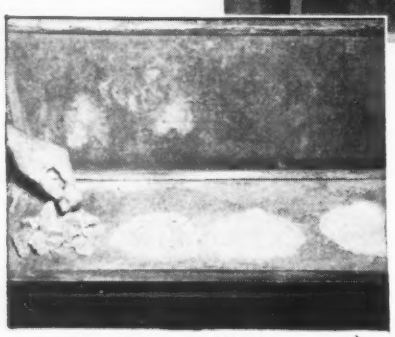
Better, Safer Jacks Since 1899

Simplex
LEVER · SCREW · HYDRAULIC
Jacks

MIR-O-COL Hard-Facing

Worked 200 Hours

at Gladding McBean & Co. Southgate, Calif.



—Without Resurfacing

the scraper blade in the Clearfield grinder where..

—50 Tons of Quartzite Is Ground

on each 8-hour shift to make silica brick. The fine grains (shown above) cut non-protected scraper blade edges below tolerance in two weeks. With MIR-O-COL Hard-Facing No. 2 on the blade, more than four weeks continuous output results. Write today to learn of other application procedures. Dept. B-17.

FREE

MIR-O-COL

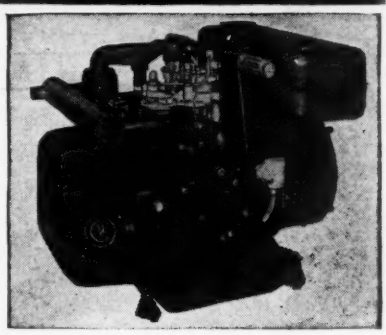
HARD-FACING RODS

ALLOY COMPANY

2416-60 EAST 53RD STREET, LOS ANGELES 11, CALIFORNIA

ELECTRIC Generating PLANTS

350 TO 35,000 WATTS AC or DC



Reliable, practical and low cost. Available in all sizes. Portable, self-contained, inherently regulated generator.

Write for details.

CONSTRUCTION MACHINERY CO.

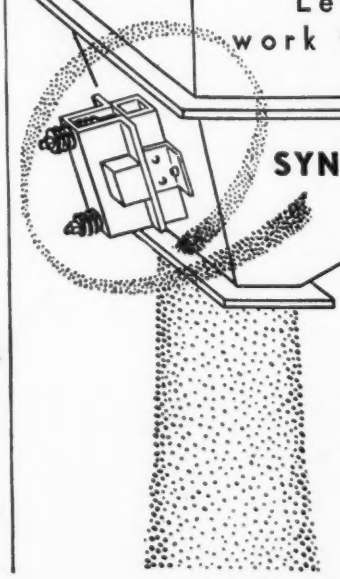
WATERLOO, IOWA

MIXERS • PUMPS • HOISTS
BATCHING & PLACING EQUIP.
SAWS • CARTS • BARROWS

FREE

Your bins, bunkers, weigh-hoppers, screens and chutes from pounding and sledging this easy inexpensive way.

Let VIBRATION work for YOU . . .



SYNTRON VIBRATORS

Made in eight sizes:

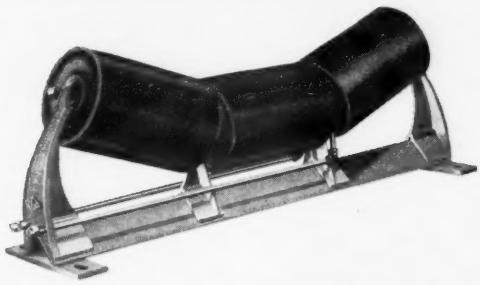
25 lb. - 55 lb. - 75 lb.
200 lb. and 500 lb.
"IMPACT MODELS"

4 lb. - 9 lb. and 15 lb.
"NOISELESS MODELS"

SYNTRON COMPANY

975 LEXINGTON AVENUE
HOMER CITY, PA.

Continental
BELT CONVEYOR IDLERS



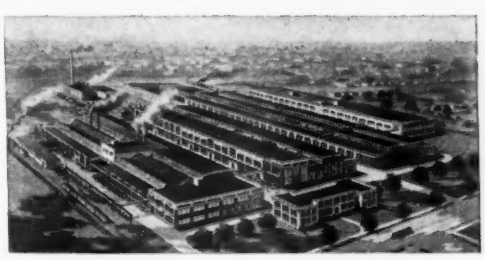
Cut Costs in Handling Bulk Materials

Continental Belt Conveyor Idlers are demonstrating their economy, efficiency and superior performance in the handling of bulk materials in many of our nation's largest plants, coal mines and quarries.

Continental can engineer and furnish complete installations or accessories, such as Idlers, Bearings, Take-Ups, Pulleys, Drives, Reducers, Hold-Backs, Trippers, etc.

Write for Engineering Data Book ID-105

One of Three Large Plants



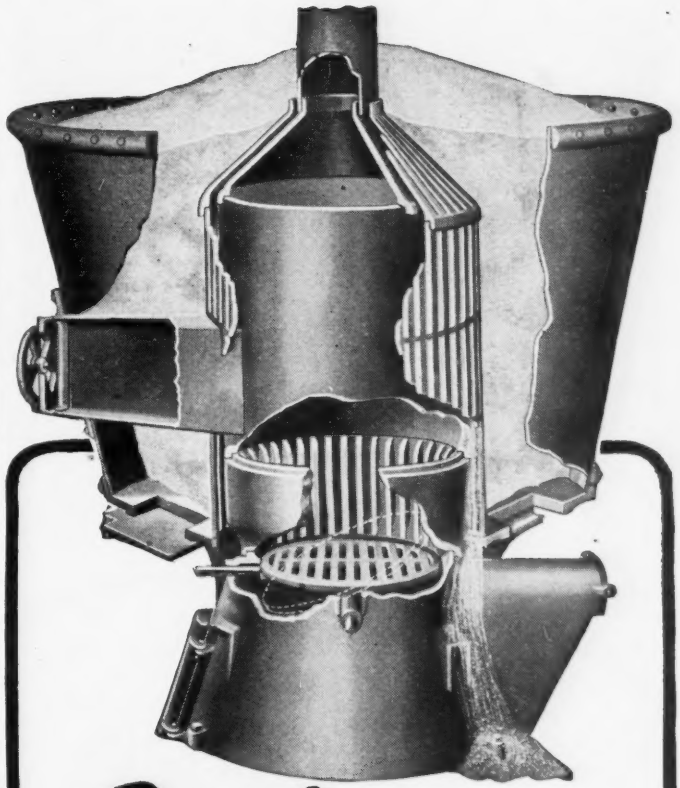
Birmingham, Alabama plant of Continental Gin Company—10 acres under roof.

INDUSTRIAL DIVISION

CONTINENTAL GIN COMPANY

BIRMINGHAM, ALA.

ATLANTA . . . DALLAS . . . MEMPHIS



Viloco
AUTOMATIC SAND DRYER

Reduces Fuel Costs for Drying Sand

The operation of the Viloco Sand Dryer is automatic—sand flows freely through the grating as it dries. The grating is so constructed that it prevents wet sand coming in contact with the stove. Plenty of cleaning slides are provided around the hopper base for ready removal of any material that cannot pass through the grating. The fire grate can be removed through the ash door. Parts of stove subjected to fire are made of Chrome Nickel Heat Resisting Iron.

The Viloco Sand Dryers are made in two sizes. The hopper capacity of the No. 1 featured above is 3 cubic yards and a smaller size, No. 2, with 1 cubic yard capacity.

The hopper should empty itself about once every two hours under ordinary conditions.

VILOCO RAILWAY EQUIPMENT CO.

332 SOUTH MICHIGAN AVENUE · CHICAGO

Mines Equipment Company
St. Louis, Missouri
Gentlemen:
Attached is a Purchase Order for 18 Male and Female Molded Rubber Cable Connectors. We would like them two conductor with faise code.
We have used the above connectors for years. We have found them to be the best connectors on the market, for our kind of work. Due to the War we have been unable to find any of these connectors on the market. If it is at all possible we would be very grateful if you could fill the above order.
Sincerely yours,
— Name on Request
Yes, MINES RUGGED MOLDED RUBBER CONNECTORS ARE ONCE AGAIN AVAILABLE TO YOU!

Now that military demands no longer completely tax our production facilities, we are able once again to supply Mines Molded Rubber Cable Connectors to all industry.

Mines Connectors when molded to electric cable become a part of the cable itself, giving a safe, efficient, water sealed connection. Mines Connectors can be furnished for splicing to cable in your own plant or molded to specified cable lengths.

Our engineers will gladly work with you in solving portable cable applications. Mines Connectors are available in single or multi-conductor, on capacities up to 5000 volts and 325 amperes.

For efficient, safe, flexible electric power transmission by cable, use Mines Connectors —"The Connector With The Water Seal."

WRITE FOR BULLETIN MC-106, showing many successful applications of Mines Connectors throughout industry.

MINES EQUIPMENT COMPANY

4263 Clayton Avenue • St. Louis 10, Missouri

See SPEER for...

...STEPS UP PERFORMANCE of Motors and Generators

Watch d-c and slip-ring motors and generators *pep up* when the Matched Commutation of SPEER Brushes gets on the job.

Matched Commutation — the matching of brushes, mechanically and electrically, to the service characteristics of the machines they're sold to serve — has been a SPEER specialty for almost 50 years. That's why SPEER brushes give you utmost freedom from burning, sparking, overheating, excessive wear and energy losses, and other brush troubles that decrease operating efficiency, cause extra maintenance.

Save time. Avoid the possibility of brush "misfits." From its all-inclusive line of standard and special carbon, graphite, electrographite, and metal-graphite brushes, SPEER can supply the grade that will deliver peak performance, with fewer brush renewals and less maintenance, on any commutating equipment.

So for brushes matched to *your* machines, call on SPEER — write for Brush Data Forms.

CHICAGO • CLEVELAND • DETROIT
MILWAUKEE • NEW YORK • PITTSBURGH

SPEER
CARBON COMPANY
ST. MARY'S, PA.

HOLDS FAST UNDER ROUGHEST CONDITIONS

The oldest insulating tape known, popular for nearly 60 years. Preferred for wrapping-mining-machine and gathering-locomotive cables because it's built to withstand the roughest treatment. Only Ruberoid Insulating Tape has all these 7 features:

1. Double grip—both sides adhesive.
2. Great tensile strength—tough.
3. Won't tear, ravel or pucker.
4. Resists abrasion.
5. Acid- and alkali-proof.
6. Extra thick—one layer insulates.
7. Exceeds A.S.T.M. specifications by 300% in adhesiveness, 26% in tensile strength, 290% in dielectric strength.

RUBEROID

INSULATING TAPE

The RUBEROID Co.
Executive Offices, 500 Fifth Avenue, New York 18, N. Y.

IMPROVED
SUTTON SAND DRYING STOVE

The same time tested principle for drying sand as used in Sutton STANDARD Sand Drying Stoves for more than forty years is employed in the No. 0 Sutton IMPROVED Sand Dryer.

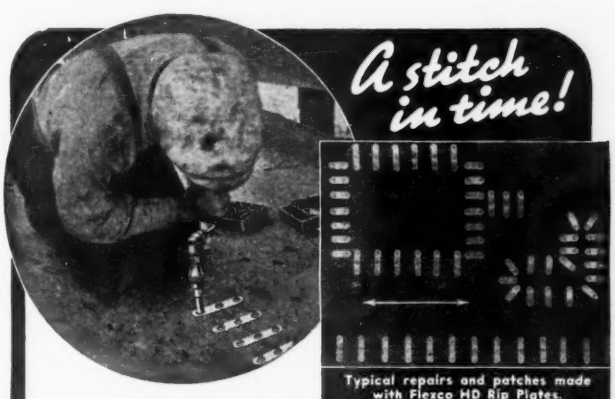
NEW FEATURES

- PERFORATED RING of an entirely new design.
- A FIRE BOWL added between the grate and perforated ring.
- New type FIRE GRATE.
- ASH PIT DOOR EXTENSION to protect clean sand from ashes.
- 3/16" STEEL PERFORATED SKIRTING with clean out Doors.
- ECONOMY FLAME SPREADER in dome.

Catalog and Prices sent upon request.

INDIANA FOUNDRY COMPANY

950 Oak Street, Indiana, Pa.



Typical repairs and patches made with Flexco HD Rip Plates.

THOUSANDS of men in industrial plants, mines and mills all over the country are doing just what this man is doing. They are cutting costs by repairing conveyor belts with Flexco HD Rip Plates.

WRITE TODAY FOR BULLETIN F-100 that shows how easy it is to repair rips, to strengthen soft spots and to put in patches by using Flexco HD rip plates. The bulletin also shows how to make tight butt joints in both conveyor and elevator belts with Flexco HD Belt Fasteners. These fasteners are made in six sizes. Furnished in special analysis steel for general use and in various alloys to meet special conditions.

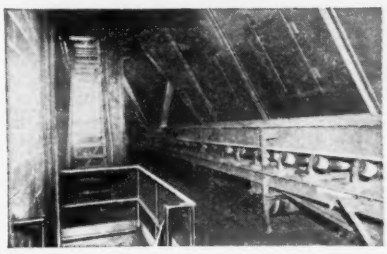
Flexco HD Rip Plate

Flexco HD Belt Fastener

FLEXIBLE STEEL LACING CO.
4638 Lexington St., Chicago, Ill.

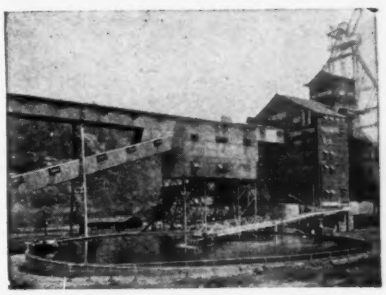
FLEXCO HD BELT FASTENERS
REG U.S. PAT. OFFICE
Sold by supply houses everywhere

"PENNSYLVANIA"



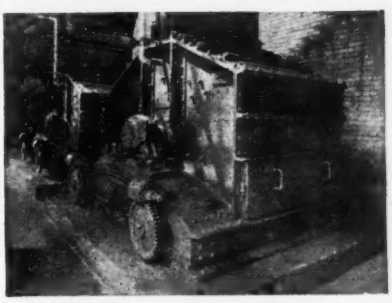
"PENNSYLVANIA"

Bradford - Hammermills delivering 1400 tons of prepared coal hourly to Belt, at one of the world's largest Generating Stations.



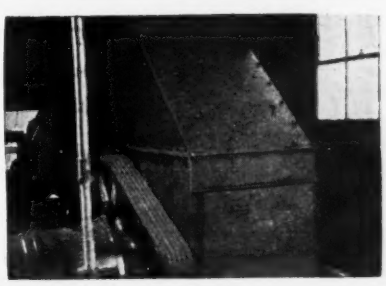
"PENNSYLVANIA"

BRADFORD COAL BREAKER and Cleaner preparing 500 tons of ROM to 4½" size for washing.



"PENNSYLVANIA"

REVERSIBLE HAMMER-MILLS preparing Bradford-treated coking coals for By-Product Ovens,—at the rate of 600 tons hourly.



"PENNSYLVANIA"

SLOW SPEED GRANULATOR preparing "Premium" Domestic Stoker Sizes at Mine.

"PENNSYLVANIA"

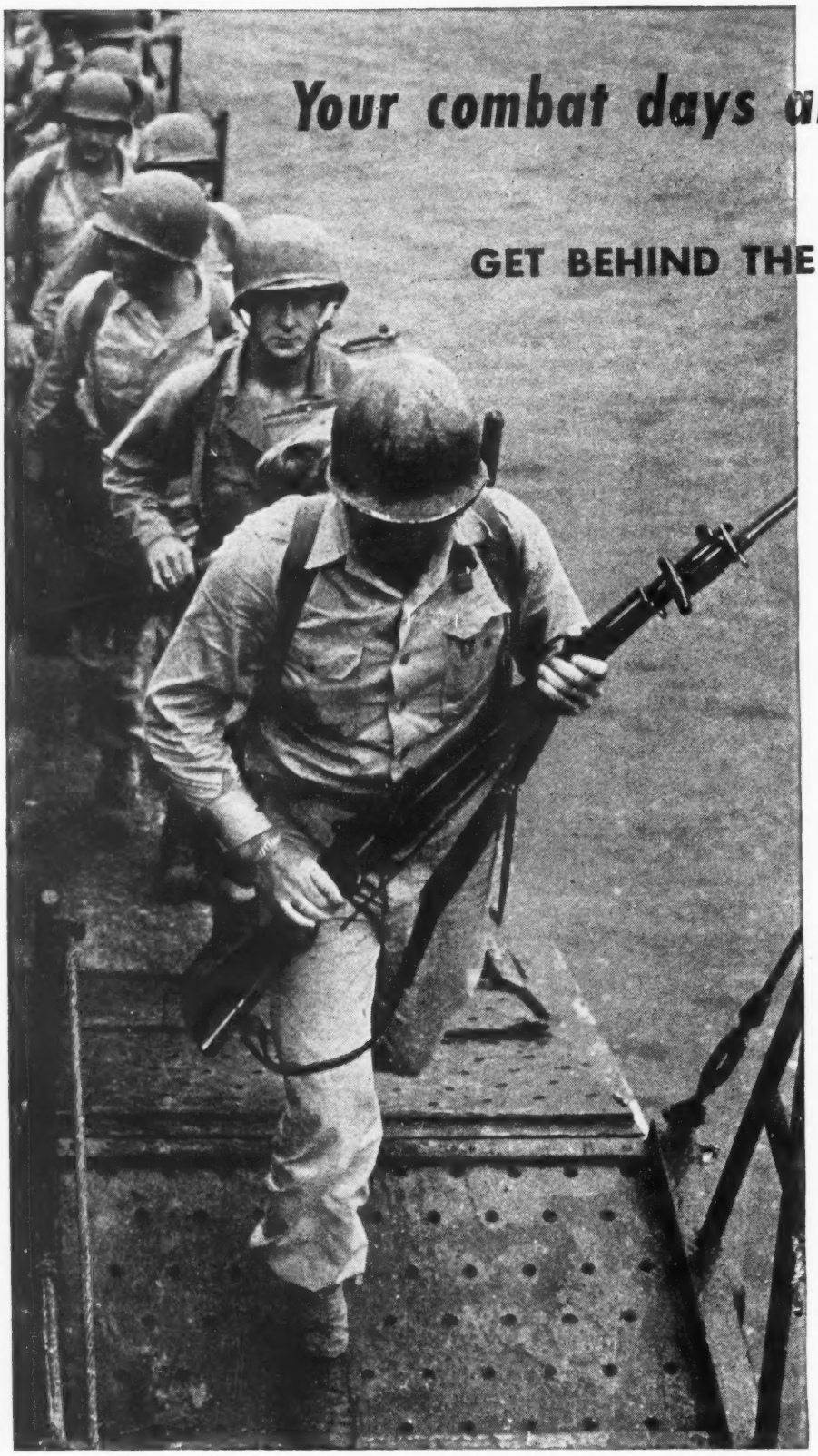
SINGLE ROLL CRUSHER, adjustable for 1" to 8" crushing, with automatic Tramp Iron protection, preparing Commercial Sizes at Mine.

World-wide installations of these "Pennsylvania" STEELBUILT types, prepare approx. 300,000,000 tons of Steam and Coking Coals per annum.

Experience gained from these installations during the past 40 years is at your service.

General Offices: Liberty Trust Bldg., Philadelphia — PENNSYLVANIA CRUSHER COMPANY — Associated with Fraser & Chalmers Engrs. Wks., London

COAL PREPARATION



Your combat days are not over!

GET BEHIND THE VICTORY LOAN!

There's plenty of action ahead for fast-thinking industrial leaders in putting over the new Victory Loan! Your Victory drive is important because:

EVERY VICTORY BOND HELPS TO

1. Bring our boys back to the America for which they were willing to give their lives!
2. Provide the finest of medical care for our wounded heroes!

BOOST THE NEW F. D. ROOSEVELT MEMORIAL $200 BOND!

Urge all your employees to buy this new Franklin Delano Roosevelt Memorial $200 Bond through your Payroll Savings Plan! At all times better than ready cash, Victory Bonds are industry's "Thanks" to our returning heroes!

START YOUR VICTORY DRIVE TODAY!

Every Victory Bond aids in assuring peacetime prosperity for our veterans, our nation, your employees—and your own industry!

The Treasury Department acknowledges with appreciation the publication of this message by

VICTORY LOAN

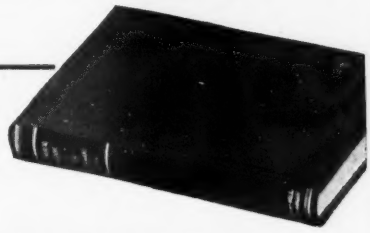
COAL AGE

★ *This is an official U. S. Treasury advertisement prepared under the auspices of the Treasury Department and War Advertising Council* ★

3

McGraw-Hill books
to help you on the job

See them for 10 days FREE trial examination



MECHANICAL LOADING OF COAL UNDERGROUND

By IVAN A. GIVEN, Editor, Coal Age. 397 pages, 6 x 9, $4.00.

Most efficient methods of using various types of loading machines, conveyors, scrapers, and certain special equipment, in the loading and handling of coal underground. Discusses types of equipment used in slope-sinking, entry-driving, and development work, and in production of coal from the usual or regular working sections. Demonstrates methods used with various types of equipment, and installation of machinery. Includes over 200 maps, plans and sketches.

AMERICAN ELECTRICIANS' HANDBOOK

By TERRELL CROFT. Revised by **CLIFFORD CARR,** Head of Electrical Engineering Department, Pratt Institute. 1600 pages, 1177 illustrations, 5 x 7½, $5.00.

Packed with the facts which every man engaged in electrical work needs at hand, from clear explanation of the fundamentals of electricity to means of remedying electrical equipment troubles. Helps electrical men select and install commercial electrical apparatus and materials, and operate and maintain all electrical equipment. Covers conductors, circuits, general equipment, generators, motors, transformers, outside distribution, interior wiring and electric lighting.

MECHANICAL ENGINEERS' HANDBOOK

Edited by LIONEL S. MARKS, Gordon McKay, Professor of Mechanical Engineering, Emeritus, arvard University. 2276 pages, $7.00.

Covers every branch of mechanical engineering, from aeronautics to mechanical refrigeration, from power generation to welding, from metal-cutting machines to hoisting and conveying—with a profusion of concise descriptions, fundamentals, formulas, methods, tables, diagrams, etc. The contributors number more than 100 engineers and specialists. 4th edition largely rewritten, fully revised, chock-full of the most useful and up-to-date facts.

You may see one or all for 10 day test period

FILL IN AND MAIL THE ON-APPROVAL COUPON

McGRAW-HILL Book Co., Inc., 330 W. 42nd St., New York 18, N. Y.

Send me the books checked below for 10 days' examination on approval. In 10 days I will send remittance, plus few cents postage, or return books postpaid. (Postage paid on cash orders.)

- ☐ Given's—Mechanical Loading of Coal Underground $4.00
- ☐ Croft's —American Electrician's Handbook $5.00
- ☐ Mark's —Mechanical Engineers' Handbook $7.00

Name .....

Address .....

City and State .....

Company .....

Position C-10-45

(Books sent on approval in United States only.)

UNIT 514
Speeds Up Coal Handling!

Fast operating crawler type crane . . . maneuvers easily . . . combines LIFT ability, plus stability. Famous UNIT one-piece cast gear case . . . disc type clutches . . . automatic traction brakes. Low initial cost and low upkeep. Fully convertible. Write for literature.

FULL VISION CAB
Operator can see in ALL directions. Promotes safety. Increases efficiency.

CAPACITY 5 TONS
⅜ or ½ YD.

UNIT CRANE & SHOVEL CORP. MILWAUKEE 14, WIS., U. S. A.

PROMPT DELIVERIES

TROLLEY POLES - *and* - TAMPING STICKS

Standard size have 2½" dia. base and 1¾" dia. top end in any desired length. Standard size 12c per lineal ft. 14c per lineal ft. on other special sizes.

Made in hardwood in following sizes:
1⅛" dia., 5c per foot
1¼" dia., 6c per foot
1½" dia., 8c per foot

WRITE FOR CATALOG NO. 10

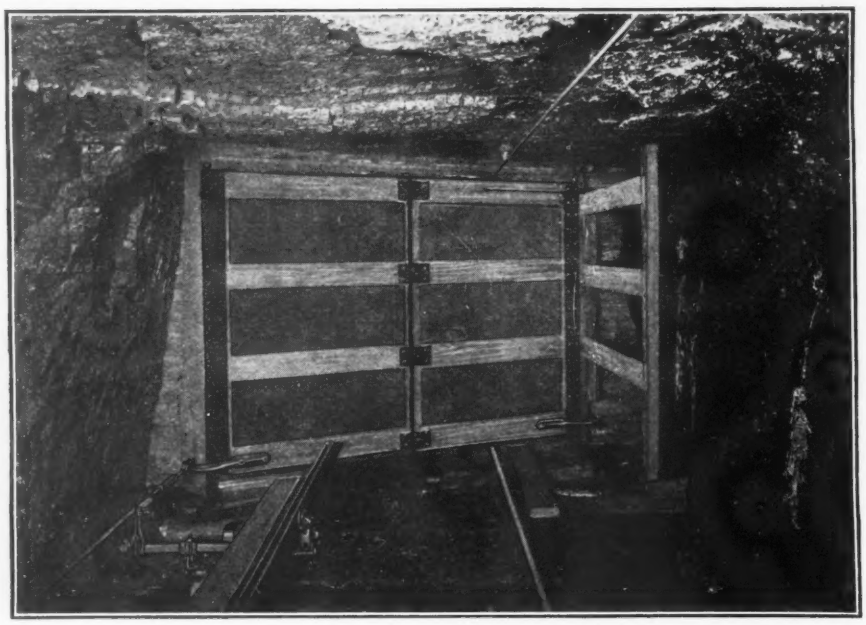
J.V. HAMMOND SPANGLER, PENNA.

WINTER IS APPROACHING—WATCH YOUR VENTILATION

ADEQUATE AIR *with* SUFFICIENT VELOCITY

Controlled with Canton Automatic Mine Doors will Prevent

MINE EXPLOSIONS



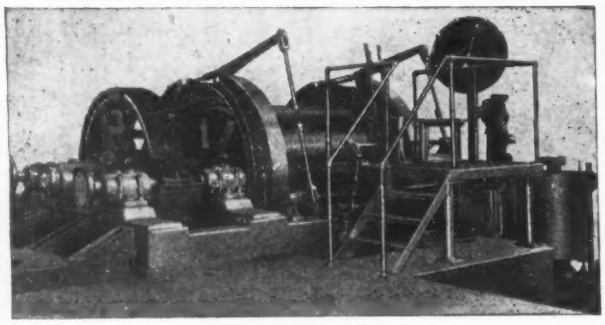
A lurking pocket of gas, allowed to accumulate because of insufficient velocity of air, is back of nearly every mine explosion.

Velocity of air is destroyed by splitting the air too frequently with overcasts; by hanging brattice cloth where doors should be used; by hand trapped or other doors which remain open too long and short circuit the air otherwise under control. A supposedly non-gaseous mine is the most dangerous and results in the greatest toll of life when an explosion occurs because it creates a false sense of security, inviting catastrophe.

The American Mine Door Company 2039 DUEBER AVE. CANTON 6, OHIO

VULCAN-DENVER

25,000 Lb. Rope Pull
SLOPE HOIST



Duplex drive with two 450 H P. motors We have built two of these for one large western mine operation with a third now on order for the same company . . Heavy weldment drum, herringbone gears, oil-operated gravity-acting post brakes Rope speed 1500 f.p.m.

Electric, Steam, Diesel & Gasoline Hoists--Scrapers, Loaders, Conveyors, Skips, Cages, Sheaves.

VULCAN IRON WORKS CO
DENVER COLORADO

National

CLASSIFIED ADVERTISING

for bringing business needs or opportunities to the attention of men associated in administrative, executive, management, sales and responsible technical, engineering and operating capacities with the industries served by

The SEARCHLIGHT SECTIONS of

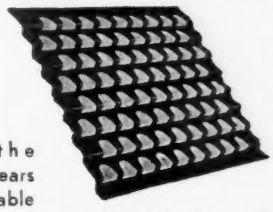
Air Transport
American Machinist
Aviation
Aviation News
Bus Transportation
Business Week
Chemical and Metallurgical Engineering
Coal Age
Construction Methods
Electrical Contracting
Electrical Merchandising
Electrical World
Electronics
Engineering News-Record
Engineering and Mining Journal
E & M J Markets
Factory Management and Maintenance
Food Industries
Power
Product Engineering
Textile World.

For advertising rates or other information address:
Departmental Staff

McGRAW-HILL PUBLISHING CO., INC.
330 W. 42nd St., New York 18, N. Y.

HENDRICK FLANGED LIP SCREENS

For more exact sizing!



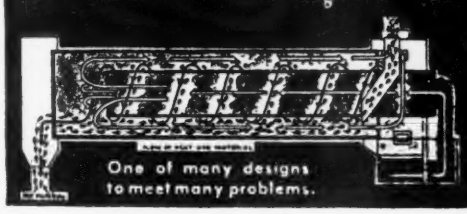
Since Hendrick developed the Flanged Lip Screen over 10 years ago, it has proved the best available for screening and dewatering bituminous and anthracite coal. Tapered openings guard against clogging—speed screening! Flange at the end of each clot agitates material, shakes off slack, and provides more efficient separation. Write for full data.

HENDRICK MANUFACTURING CO.
64 DUNDAFF ST. CARBONDALE, PA.
Sales Offices in Principal Cities

Benefit by the many years of experience in designing and manufacturing of

The L.R. CHRISTIE CO.

17 E. 42nd Street
New York 17, N.Y.



One of many designs to meet many problems.

Dryers
Calciners
Coolers

HOBART *Helps You Change to Better, More Economical Welded Design*

With this new design service, Hobart is helping industry to improve their products and reduce their production costs. Investigate "Practical Design for Arc Welding" today . . . three volumes of 100 designs as compiled by one of America's foremost welding consultants. These designs have improved the products and reduced production costs for various industries and can do the same for you.

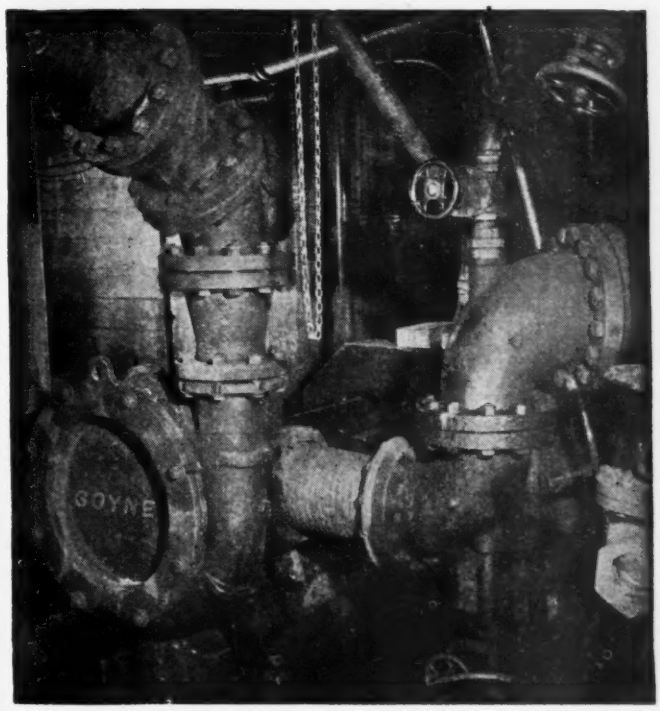
Only **$3.50** *ea. Set of* **3** *for* **$10.00** *postpaid.*
HOBART BROS. CO.
Box CA-105, TROY, OHIO

Free! Welder's "Handy Vest Pocket Guide" that contains charts, tables, other welding information.

HOBART *"Simplified"* **ARC WELDERS**

"One of the World's Largest Builders of Arc Welders"

GOYNE PROCESS PUMPS



A Sand Pump is only a link in a chain in a coal washing plant, but it can be a strong link if it embodies the following features as does the Goyne:

1. Ease of inspection of all wearing parts. All internal portions are immediately accessible after removing only the rear head of the pump. No suction or discharge piping is disturbed.

2. The one packing box of the pump is subjected only to suction pressure and is readily kept clean by a low pressure clear water line. Long packing and shaft sleeve life is assured.

3. Impeller clearance is adjusted *while the pump is running*, insuring constant pump capacity so essential for uniform washing.

4. There are twenty-eight possible nozzle assembly combinations for each standard pump. Washery designers like this "adaptability feature" as it helps them out of tight places and simplifies piping.

5. We carry the spare parts stock. Order your replacements when needed. Reduce your inventory by using Goyne Process Pumps.

All inquiries receive prompt and careful attention.

THE GOYNE STEAM PUMP CO.

ASHLAND, PA.

The Cincinnati
TRADE MARK

Write today for FREE illustrated bulletin

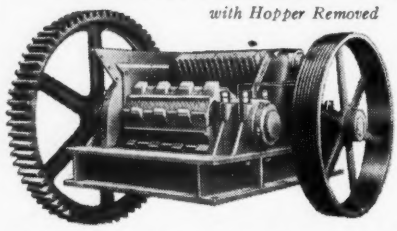
ONE-MAN COAL DRILL

. . . lowers drilling costs because it is designed and constructed to give more power "pound for pound" and more drilling efficiency "day after day". Used successfully in drilling both anthracite and bituminous coal. Easy to operate. Sold with money-back guarantee. Write today.

THE CINCINNATI ELECTRICAL TOOL CO.
Division of The R. K. LeBlond Machine Tool Co.
2635 MADISON ROAD - CINCINNATI 8, OHIO

PERFORATED METAL
COAL MINING SCREENS
Manufactured exactly to your specifications.
Any size or style screen, in thickness of steel wanted with any size perforation desired.
We can promptly duplicate your present screens at lowest prices.
CHICAGO PERFORATING CO.
2443 West 24th Place
CHICAGO, ILLINOIS
Canal 1459

McLANAHAN *All Steel*
ROCKMASTER CRUSHERS
with Hopper Removed

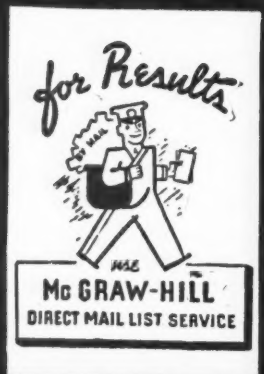


Designed for crushing mine refuse and coal, reducing the formation for further processing. Write for data.

Pit, Mine and Quarry Equipment Headquarters since 1835

McLANAHAN and STONE CORPORATION
HOLLIDAYSBURG, PENNA.

What



Direct Mail Division

Makes A Mailing *CLICK?*

Advertising men agree—the list is more than half the story.

McGraw-Hill Mailing Lists, used by leading manufacturers and industrial service organizations, direct your advertising and sales promotional efforts to key purchasing power. They offer thorough horizontal and vertical coverage of major markets, including new personnel and plants. Selections may be made to fit your own special requirements.

New names are added to every McGraw-Hill list daily. List revisions are made on a twenty-four hour basis. And all names are guaranteed accurate within two per cent.

In view of present day difficulties in maintaining your own mailing lists, this efficient personalized service is particularly important in securing the comprehensive market coverage you need and want. Ask for more detailed information today. You'll probably be surprised at the low over-all cost and the tested effectiveness of these hand- picked selections.

McGraw-Hill Publishing Co., Inc.
330 West 42nd Street *New York, 18, N. Y.*

SEARCHLIGHT SECTION

EMPLOYMENT • BUSINESS • OPPORTUNITIES • EQUIPMENT—USED or RESALE

POSITIONS VACANT

WANTED: EXPERIENCED, capable, reliable engineer, for a growing, reliable stripping coal corporation. Permanent position. Give experience, reference and salary expected. Write P-318, Coal Age, 520 N. Michigan Ave., Chicago 11, Ill.

WANTED: MASTER mechanic for reliabable growing coal stripping corporation. Must know large stripping equipment. Give full details as to experience, reference and salary expected. Write P-319, Coal Age, 520 N. Michigan Ave., Chicago 11, Ill.

POSITION AVAILABLE for man having the qualifications, capabilities and character to assume duties as Chief Mining Engineer. Excellent location. Prefer man 40 to 47 years of age. Replies will be considered confidential. P-326, Coal Age, 330 West 42nd St., New York 18, N. Y.

SAFETY. A large coal company, Western Pennsylvania, has an opening for a Safety Inspector. Any applicant should have State Certificates and be a hustler. An unusual opening is available for such a man. P-327, Coal Age, 330 W. 42nd St., New York 18, N. Y.

WANTED: ENGINEER to run property and out-crop lines by a coal company in southern West Virginia. Salary will depend upon ability. Give full details in your first letter to P-328, Coal Age, 330 W. 42nd St., New York 18, N. Y.

POSITIONS WANTED

POSITION AS Mining engineer or draftsman. Thirty years experience. Registered in State of West Virginia. Good references can be furnished. PW-324, Coal Age, 330 W. 42nd St., New York 18, N. Y.

YOUNG BELGIAN mining engineer, 32 years old, eight years practice in coal mining, desires early engagement in an American mine of any kind. Address J. Delhaye, 51 Avenue Reine Astrid, Hasselt, Belgium.

BUSINESS OPPORTUNITIES

COMPANY WITH loaders and other mining equipment for high coal please contact inactive mine owner for attractive proposition to operate property. Describe equipment. BO-329, Coal Age, 520 N. Michigan Ave., Chicago 11, Ill.

FOR SALE or lease—2400 acres of Colorado Routt County Coal. 9½ foot vein; railroad connection. BO-329, Coal Age, 520 N. Michigan Ave., Chicago 11, Ill.

FOR SALE or lease—approximately 500,000 tons of coal. Miller seam at Dilltown, Penn. Mine is opened—tipple erected and siding available on P.R.R. Write if interested to BO-330, Coal Age, 330 W. 42nd St., New York 18, N. Y.

4300 ACRES coal land in Scott County, Tennessee. Low price for quick sale. Geo. E. Davis, Bristol, Va.

FOR LEASE, cooperative mining or sales contract for operating capital. Equipped slope mine, famous "Shinn" or "Bernice" basic, three foot view, only true "Arkansas Anthracite", truly smokeless. Address property and mine owners, The Arkansas Anthracite Coal Co., Russellville, Arkansas.

4,000 ACRES of coal land to lease on royalty. 16 ft. 6" strip coal other veins 3 to 6 ft. Near N and W RR. Near Pocahontas District. J. M. Wolford, Cedarville, Va.

WANTED

Mechanical Engineer

With design and layout experience on material handling and coal preparation equipment by mid-western manufacturer outside metropolitan district. Give experience and salary expected.

P-325, Coal Age
520 North Michigan Ave., Chicago 11, Ill.

DRAFTSMEN ENGINEERING

Designers and layout men experienced in the design of steel structures material handling equipment and foundations as related to modern coal preparation plants. Also draftsmen capable of detailing conveyor frames, chutes, hoppers and other miscellaneous platework and structural items.

To those who are interested and can quality we offer a permanent connection, with steady work and plenty of overtime.

In answer to this advertisement give full particulars to age, experience, education and other qualifications. Personal interviews will be arranged if qualifications are acceptable.

Fairmont Machinery Co.
Fairmont, W. Va.

Opportunities in Research

Unusual opportunities in the postwar period will be available at Battelle Memorial Institute for qualified research men now in the services or engaged in war research.

This endowed industrial and scientific research institution will add a selected number of competent scientists to its staff just as rapidly as they are relieved of their war responsibilities. The men chosen will be given every opportunity to develop in their professional fields and to apply their scientific knowledge to the solution of industrial problems.

Such men will find modern scientific tools available for their use in the well-equipped Battelle laboratories, and they will be aided by a comprehensive program of fundamental research designed to expand their knowledge and their ability. Battelle operates in an unusual atmosphere which has a strong appeal to the professional research man. Opportunities for further education, technical growth, and administrative responsibility exist.

Experienced research men in the fields of chemistry, chemical engineering, electrochemistry, physics, metallurgy, fuels, light metals, plastics, ceramics, mechanical engineering, design and product engineering, electrical engineering, applied mechanics, mining, raw materials, and allied technical professions will be considered.

Whatever your postwar plans may be, inquire now about these opportunities at Battelle. Write to:

Battelle Memorial Institute
Columbus 1, Ohio

WANTED

Superintendent or Mining Engineer

For large strip mine in North Dakota. Good chance for personal advancement. Write fully and state salary desired.

DAKOTA COLLIERIES COMPANY
1506 Foshay Tower
Minneapolis, Minnesota

RELAYING RAILS
With Angle Bars
IMMEDIATE SHIPMENT

300 tons	— 100#
1200 tons	— 80#
600 tons	— 75#
900 tons	— 70#
700 tons	— 65#
300 tons	— 52#
25 tons	— 12#

Also other sizes of new and relaying rail and angle bars located at our various warehouses.

Buyers, sellers and trades of cars locomotives, reclaimed car parts, structural steel.

HYMAN-MICHAELS COMPANY
122 SOUTH MICHIGAN AVENUE
CHICAGO 3, ILLINOIS

WANTED IMMEDIATELY
ELECTRIC MOTORS
MOTOR GENERATORS
LARGE AIR COMPRESSORS

PAUL JAY
401 Broadway New York 13, N. Y.

WANTED

Considering purchase of 10 yard late type dragline, either electric or diesel but diesel preferred. State location, condition, make, size, age, price, and terms in first letter.

W-322, Coal Age
520 North Michigan Ave., Chicago 11, Ill.

MINING OPPORTUNITIES

There are thousands of acres of undeveloped number three coal in and around Clinton, Indiana. This seam of coal will average six and one-half feet. It is one of the best steam coals in the United States when properly cleaned.

There are two big mines operating now and they have sales for all their production. This is a regular vein of coal. There are old railroad, road beds, and several old shafts which worked out upper veins, that could be used.

For further information write, H. S. Call, Treas. of The Clinton Exchange Club, 227 Blackman St., Clinton, Indiana.

WANTED

COAL STRIPPING PROPERTIES

Have stripping equipment and am interested in hearing from parties having stripping proposition to offer. Give full details and information concerning property. Location, nearest railroad. Thickness of seam, thickness of over-burden and nature of material. Also Analysis of coal if possible. Prefer to handle on royalty basis.
Address P. O. Box 68, Newcomerstown, O.

16,500 acres land with estimate of 300,000,000 tons of coal, $7.50 per acre. Also coal land suitable for strip mining. Complete details upon request.

G. B. LORRAINE
Law Bldg. Richmond 19, Va.

PROMPT SHIPMENT FROM OUR WAREHOUSE

MINING MACHINES

28 A Jeffrey 250 v. 6' cutter bar.
2—12 DA 50 HP 250 v. Goodman Shortwall.
12 G3 Goodman AC Shortwall, 220/3/60.
Jeffrey Permissible Top Cutter.

STORAGE BATTERY LOCOMOTIVES

2—6 Ton G.E. Permissible Locomotives 36/44" Ga. O.S. armorplate frame. Inside steel tired wheels, 2-HM 825 Ball Bearing Motors, Type LSBE, Class 2C6 Form C9. 13½' long, 50" high, 69" wide and 44" Wheel base.
Each of the above units equipped with Edison Battery 80 cell A-10—one new in 1940, the other in 1939.
1—5 to 5½ Ton Type D Ironton, 36 or 42" Ga.
1—5 Ton Atlas 40" or 44" Ga. with 2 Ball Bearing Motors. Battery box on top of locomotive.
4 Ton 36" Ga. Atlas 2 BB Motors.
4 Ton 36" Ga. G.E. 2 BB Motors.

Haulage & Gathering Locomotives

13 Ton Westgh. 250 V. 36" or 40" Ga.
13 Ton Westgh. Bar Steel 500 v. 40/42".
10 Ton Jeffrey 500 V. 36/42" Ga.
6 Ton Jeffrey 250 v. 36/42" Ga. with motor driven cable reel.
2—6 Ton G.E. 500 v. 42/44" Ga. gathering.
2—6 Ton G.E. 250 v. 42/44" Ga. gathering.
3—5 Ton 30B Goodman 250v. 36" Ga. elec. reel.
1—5 Ton Morgan Gardner 250 v. 36/42" Ga. Elec. reel.

COAL LOADING MACHINES

4—G20 Goodman Permissible Drives 500 v.
6—#1½ Goodman Duck Bills
1—#3 Goodman Duck Bill.
2—Brown Fayro LF 7½ Pit car Loaders with 500 v. permissible motors.
1—Le Grabon Rock Duster on truck 40/44" Ga.

SCREENS

2—4" x 5' single deck Tyler Hummer Screens. Type 37 equipped with V-16 Vibrators No. 2860 and 2867 designed for 110 v. AC 15 cy.

Rotary Con. & MG Sets (3 ph. 60 cy.)

2—300 KW G.E. HC 12 Rotary 275 v. 6 ph. with—3—125 KVA G.E. 2300 v. 1 ph. 60 cy. Transformers.
150 KW Ridgway 275 v. 900 RPM dir. con. 225 HP Ridgway Syn. Motor 2300 v. complete
150 KW GE 275 V 900 RPM interpole dir. con. 225 HP GE syn motor 2300 V AC and DC panels. Factory built units.
100 KW GE-RC 250 v. 1200 RPM dir. con. 150 HP 2200/440/220 Induction Motor complete
70 KW 250 v. S West—100 HP West. 220/440 v.
35 KW 125 v. S West—54 HP West. 220/440 v.
100 KW Ridgway 250/275 v.—150 HP Ridg. Syn. 220/440 v. 1200 RPM with AC & DC Panels.

ENGINE GENERATOR & TURBINE SETS

65 HP Primm Oil Engine belted to AC or DC Gen.
57.5 KVA Allis Chalmers Gen. 220/3/60—Kerr Tur.
50 KW West. 125 v. DC—Skinner Engine.
50 KW 125 v. DC West. Turbo. Gen.

TRANSFORMERS

Qu.	KVA	Pri. V.	Sec. V.
31	7½	2200	220/440
28	10	"	"
3	25	2200	2200
2	25	2200	110/220
1	37½	2200	110/220
1	40	2200	110/220
1	50	2200 v.	440/220

HOISTS

75 HP Lidgerwood sgl. fr. drum 24" x 25"—4½" figs.
50 HP Thomas sgl. fr. drum 26" x 25"—4" figs.
40 Lidgerwood sgl. fr. drum 40" x 30"—4" figs.
30 HP Carlin double dr. fr. 13" x 18"—5½" figs.
The above Hoists can be equipped with AC or DC Motors.

COAL CRUSHERS

18 x 18 sgl. roll Jeffrey.
18 x 24 and 18 x 30 New Scottdale dbl. roll.

CONVEYORS & LOADING BOOMS

L. Boom & Picking Table 5' W 60' Long
Steel Apron conveyor 3' W 120' Long
Steel Apron conveyor 18" W 60' Long
3—7½ HP DC—Joy Chain Conveyors with troughs

SLIP RING & SQ. CG. MOTORS

HP	Make	Speed	WDG	Type
300	West.	1750	S.R.	CW
200	G.E.	250	S.R.	MT 412
150	G.E.	600	S.R.	I-M
150	G.E.	600	S.C.	I-L
150	West.	600	S.C.	CCL
150	West.	580	S.R.	CW
100	West.	1750	S.R.	CW
100	G.E.	500	S.R.	MI-25 cy.
25	West.	575	S.R.	CW

Other sizes down to 1 HP

DC Motors and Generators 230/250 V.

HP	Make	Speed	Wdg.	Type
175	G.E.	475	ser.	MD 109
150KW	Cr. Wh.	550	cp.	
130	G.E.	550	ser.	CO 1812
100	G.E.	480	ser.	MD 108
60	G.E.	600	ser.	CO 2507
60	Cr. Wh.	800	cp.	
50KW	Cr. Wh.	1050	cp.	
50	Reliance	1500		185T
40	Roth	1750		
20	West.	1500		SK 80L

PUMPS

4" suc. 4" dis. Lee Courtney Cent.—dir. con. 40 HP AC or DC Motor.

AIR COMPRESSORS

12" x 10" Ing. Rd. ER 1 355 cu. ft. 100#.
9" x 8" Chg. Pneu. Type NSB 175 cu. ft. 100#.

MOORHEAD-REITMEYER CO., INC. **Pittsburgh 19, Pennsylvania**

Serving the Coal Industry for more than a Quarter of Century

-TRANSFORMERS-

1—2500 KVA 26400/13200-480/460 V. 3-ph.
2— 500 KVA 12240-123/213Y V. 3-ph.
3—1667 KVA 45100-2300/4000Y V.
3— 500 KVA 13200-2300 V.
3— 333 KVA 22000-2300/4000Y V.

One Year Guarantee

THE ELECTRIC SERVICE CO., INC.
"AMERICA'S USED TRANSFORMER CLEARING HOUSE"
STATION M Since 1912 CINCINNATI 27, OHIO

LATHES

36" x 20' American Grd. Hd. Q. C. Motor Drive. Raised to swing 50".
27" x 16' Lodge & Shipley Grd. Hd. Taper—

RADIAL DRILLS

6' American Triple Purpose, M.D.
6' Cincinnati Bickford Radial M.D.
7' Cincinnati Bickford Radial M.D.
5' American Triple Purpose Plain.

CINCINNATI MACHINERY & SUPPLY COMPANY
218 E. Second St., Cincinnati, Ohio

FOR SALE

HOISTS

1—Shepard Niles Electric Hoist to raise loading boom conveyors, capacity 2000#, 5 HP, 3 ph, 60 cy, 440 volts, with controls.

1—Ottumwa Electric hoist, single rigid-cylindro-conical drum, with automatic control. Weight of cage 7000#, weight of car 2500#, weight of coal 6000#, lift 310', diameter of rope 1¼". Diameter of drum 60"x84". Brake, 84" diameter, 8" face, post type, oil operated. Drum shaft bearings 10"x20". Hoist is equipped with single reduction gears 19 and 229 teeth, 2½ D.P. 11" face. The drum has five grooves on the 60" diameter, 11 grooves up the cone, 4 grooves on the 84" diameter. The drum has a rope capacity of 326 feet plus three dead turns. The hoist is equipped with a 200 HP motor.

1—Ottumwa Electric hoist, single rigid conical drum type, with single reduction herringbone gear, the pinion running between two bearings and connected with motor by flexible coupling. Weight of coal 4000#, weight of car 1800#, weight of cage 4000#, total cage travel 210 ft., size of rope 1½". End lift. The hoist is equipped with a 150 HP motor.

MINING MACHINES

1—Goodman Universal Shortwall mining machine, 112DB. DC, 250 volts, Cincinnati Duplex chain, 6' cutter bar. Has new extra armature. 36" or 42" gauge.

3—Goodman Longwall mining machines, DC, 36" or 42" gauge.

7—Jeffrey 35A Shortwall mining machines, 50 HP motors, 250 volts, DC. 6' cutter bars, 36" or 42" gauge.

3—Sullivan CE-7 Shearing machines, 250 volts, DC. 7 ft. cutter bars, 36" or 42" gauge.

1—Sullivan CE-7 Shearing machine, AC, 220 volts, 3 ph, 60 cy, 7 ft. cutter bars, 36" or 42" gauge.

1—Sullivan CE-7 Shortwall mining machine, AC, 220 volts, 3 ph, 60 cy, tip-turn truck, 7 ft. cutter bar, 36" or 42" gauge.

2—Sullivan Longwall mining machines, AC, #2991, #7061.

LOCOMOTIVES

3—Goodman 5 ton locomotives, type WI-2A5, 36" or 42" gauge. One is complete with electric reel.

2—Goodman 6 ton ball bearing locomotives, type 3314T, 36" or 42" gauge.

1—General Electric Co. 8 ton ball bearing locomotive. HM-839A motors. 36" or 42" gauge.

1—Westinghouse 8 ton locomotive, cast iron frame, 36" or 42" gauge.

CRUSHERS

2—Jeffrey Crushers, single roll, size 30x30.
1—Jeffrey, Flextooth type crusher with rotory ring crushing elements, single roll, 24x36, complete with 50 HP Ball Bearing enclosed motor, 1200 RPM no load, 1155 RPM full load, V-belt driven. Crushes from 20" coal to ⅛" stoker coal.
1—American Pulverizer Company crusher, size 31"x36" Ball Bearing type S. Serial No. 1290, No. 24 driven by AC motor enclosed. Fan ventilated type direct connected to crusher by coupling motor, 30 HP, 600 RPM, 440 volts 3 phase, 60 cycle.

PIT CARS

34—Timken roller bearing cars, 8' overall length, bumper to bumper, 4'3" overall width, 2'5" overall heighth, 18½" wheelbase. 14" wheels. End dump, one link and pin, 36" gauge.

BOX CAR LOADER

1—Ottumwa new type box car loader. Will load coal from tipple into box car.

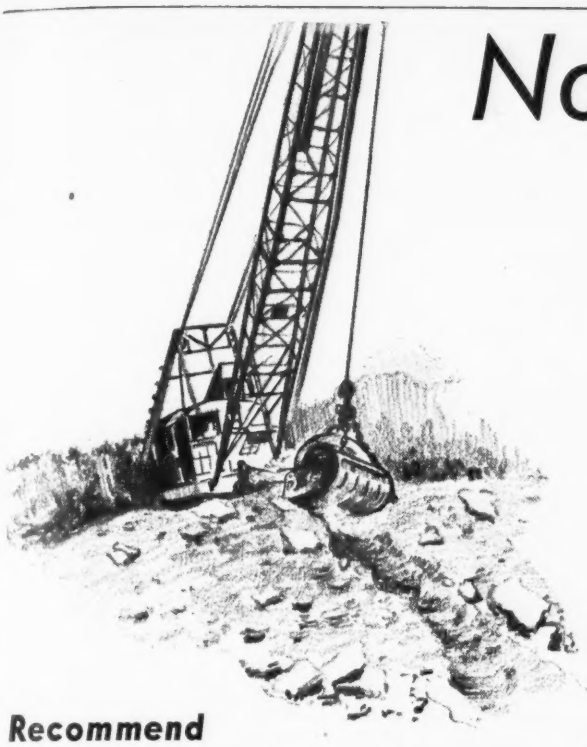
STEEL TIPPLES

1—Tipple and shaker constructed by Allen and Garcia Company. Capacity 3000 tons daily.
2—Tipples—smaller capacity than the one listed above.

Have new and second hand rails and track accessories.

We are distributors for John A. Roebling Sons Company wire rope and fittings.

GAVENDA BROTHERS
CANTON, ILLINOIS



Now— Stripping Outfits on "PAY—AS—YOU—GO"— Plan

Recommend The Following Good

SHOVELS
CRANES
DRAGLINES

Everyone of Which is Reasonably Priced!

7½ yd. Marion Electric Dragline with 110' boom. 2 buckets—one 6 yd. One 7½ yd. Ward-Leonard Controls. 1941.
4 yd. P&H Model 900 Diesel Dragline. 100' Boom.
4 yd. Bucyrus-Erie 120B shovel and dragline combination. Electrically powered.
4 yd. Bucyrus-Erie Model 100 shovel and dragline. Electrically operated.
3 yd. Monighan Walker Dragline with 80' Boom. Diesel powered.
3 yd. Marion 40A Diesel dragline. 80' Boom and 3 yd. dragline bucket.
3 yd. Bucyrus-Erie 52B Dragline. 75' Boom. 3 yd. dragline bucket.
2¾ yd. Marion Model 471 dragline and shovel combination. 60' Boom. Excellent condition.
3W Monighan 3 yd. dragline with Fairbanks-Morse Diesel Engine.
3 yd. Linkbelt K-55. 78' dragline boom. 2½ yd. shovel attachment and 3 yd. Blaw-Knox Dragline Bucket.
2½ yd. Northwest shovel and dragline combination Model 80. Gas powered.
2½ yd. Diesel Northwest 80D shovel and dragline combination.
2½ yd. Diesel Lima Model 850 dragline with 75' boom. 2½ yd. dragline bucket.
2 yd. Koehring 801 shovel and dragline combination. Diesel powered.
2 yd. Northwest 8 dragline. 90' Boom.
2 yd. Northwest Model 70 shovel and dragline.
2 yd. Bucyrus-Erie Model E2 dragline. 60' Boom.
2 yd. Bucyrus-Erie 50B electric shovel.
1¾ yd. Diesel Osgood Stripping Shovel. 35' shovel boom. 30' dipper stick.
1¾ yd. Bucyrus-Erie 43B Diesel shovel and dragline combination. 90' Boom.
1¾ yd. Koehring Model 702 Stripping Shovel. Diesel powered.
1¾ yd. P&H 775 heavy-duty. Price extremely low.
1¾ yd. Marion Model 37 Electric shovel. Exceptionally good condition.
1¾ yd. Lima 602 Diesel Shovel and Dragline combination.
1½ yd. Diesel Northwest Model 6 shovel and dragline combination. Caterpillar Diesel Engine.
1½ yd. Diesel Lorain 77 shovel and dragline combination.
1½ yd. P&H shovel and dragline Model 700B.
1½ yd. Diesel Osgood "Victor". 28' shovel boom. 24' dipper stick. Caterpillar D13000 Diesel Engine.
1½ yd. Northwest Model 6 gas shovel and dragline combination.
1½ yd. Koehring 601 shovel and dragline.
1½ yd. Lima Model 101 shovel and dragline combination.
1½ yd. Lorain 75B Diesel Shovel.
1¼ yd. Koehring Model 1 Shovel. Rebuilt.
1¼ yd. Lorain 75A gas shovel.
1¼ yd. Northwest Model 5 shovel and dragline combination.
1¼ yd. Osgood shovel.
1¼ yd. P&H shovel and dragline combination Model 650.
1 yd. Bucyrus-Erie 30B Diesel crane and shovel.
1 yd. Byers Model 29 "Master" shovel and dragline.
1 yd. Keystone Excavator with skimmer and backhoe attachment.
1 yd. Koehring Model 401 shovel.
1 yd. Speedcrane.
1 yd. Linkbelt K-30 shovel and dragline.
1 yd. Linkbelt Model "K". 45' Boom.
1 yd. Lorain 55 shovel and crane.
1 yd. Lorain 60A shovel.
1 yd. Marion shovel and dragline.
1 yd. Northwest Model 4 shovel and dragline combination.
1 yd. Northwest Model 104 shovel and dragline.
1 yd. Osgood shovel and backhoe combination.
¾ yd. Lorain. Built 1940. Shovel, backhoe and crane combination. Chain Crowd.
¾ yd. Bay City Model "R" crane. 55' Boom in three sections.
¾ yd. Bucyrus-Erie Model 1030 shovel and dragline.
¾ yd. General Diesel shovel and dragline.
¾ yd. 1940 or 1941 Koehring Model 251. Shovel and dragline combination. 60' Boom.
¾ yd. Koehring 301 shovel and dragline. Exceptionally good condition.
½ yd. 1942 Insley K-12 shovel and backhoe combination. Exceptionally good condition.
½ yd. P&H Model 150 shovel and dragline combination.
½ yd. Osgood crane with clamshell bucket. Exceptionally good condition.
⅝ yd. Model 2 Northwest shovel and crane. Rebuilt, guaranteed.
½ yd. Insley K-12 backhoe and crane combination with clamshell bucket.
⅜ yd. Bay City "Pup".
⅜ yd. Bucyrus-Erie 10B shovel, dragline, backhoe. Skeleton trailer.
⅜ yd. Bucyrus-Erie 10B shovel and dragline. ⅜ yd. drag bucket.
⅜ yd. Hanson dragline. 30' Boom. ⅜ yd. Page dragline bucket.
¾ yd. Hanson—Shovel only.
⅝ yd. Universal Shovel Model "B". Gas powered. Condition good.
⅜ yd. Linkbelt LS-40 shovel.

STEAM SHOVELS

¾ yd. Bucyrus B2
¾ yd. McMyler
¾ yd. Osgood
1 yd. Browning
1 yd. Byers
1¼ yd. Bucyrus 30B
1¼ yd. Bucyrus 30B
1¼ yd. Osgood
1¼ yd. Marion
1¼ yd. Marion 36
1½ yd. Austin
1½ yd. Bucyrus 50B
1½ yd. Marion 32
1½ yd. Marion 37
1½ yd. Osgood
1¾ yd. Marion 37
2 yd. Bucyrus 50B
2 yd. Bucyrus 14
2½ yd. Bucyrus 80B
2 yd. Marion 36
2 yd. Monighan
2 yd. Osgood
2½ yd. Osgood 70C
3 yd. Marion
3½ yd. Bucyrus-Erie 175B
3½ yd. Bucyrus 95C
3½ yd. Bucyrus Monighan
4½ yd. Bucyrus Class 24
5 yd. Marion 92
6-8 yd. Bucyrus 225B
6-8 yd. Bucyrus 230

Work your stripping job at full speed.

Cover it with Draglines, Shovels and ample hauling equipment—and get out top tonnage.

These machines are all available NOW on our "PAY-AS-YOU-GO" Plan, as announced in the last issue of COAL AGE.

Look over the partial list on this page—then WIRE or PHONE our N. Y. Office.

The above is a selection of the best machines we can offer you. A complete list will gladly be sent to you on request.
To discuss any of these machines it is perfectly all right to call us on the telephone (collect) and we will be glad to supply additional information and will also be glad to arrange for inspection.

TRACTORS TRACTORS

2—D8 Caterpillar—late models with angle-dozers and scrapers.
1—RD3 Caterpillar with bulldozers.
2—7M Caterpillar, built 1941—with scraper and dozer.
2—RD7 Caterpillar with hydraulic bulldozer.
1—D6 with LaPlante-Choate Hydraulic Dozer.
1—RD4 Caterpillar with Bulldozer.
2—RD6 with LaPlante-Choate Dozer.
1—D2 Caterpillar.
4—International TD18 Diesel with hydraulic bulldozer.
2—International TD40 with bulldozer.
3—International TD40 with bulldozer.
2—Allis-Chalmers HD14 with Baker hydraulic dozer.

ECONOMY COMPANY, INC.

49 Vanderbilt Ave., N. Y. C. **Tels. MUrray Hill 4-2294-8292-2295-2296**

LOCOMOTIVES

Goodman: All 250 volts.
1—10 ton, 31 1-4-T.
1— 6 ton, 30B. 43" 1—5 ton.
1— 5 ton, W-1-2. 36".
2— 5 ton, 2600 K.
1— 6 ton, 33-1-4-T.
2— 8 ton, 32-1-4-T.
2—15 ton 29A, 48" gauge

Westinghouse: All 250 volt.
1—4 ton, 902, 48"
1—904 c. 44" 500 volt. Also 906 motors.
1—10 ton, 915.
Bar steel frames 10 ton, 6 ton, and 4 ton

G.E.: All 250 volt,
6 ton 803, 44" as is
6 ton 823, 44"
6 ton 801
8 ton 839
Battery Locomotives G.E., Ironton and Atlas.
4 ton 1022, 44" as is
5 ton 825, 44" & 36"
8 ton 839 motors

Jeffrey: 6 ton, and 4 ton, all gauges, 250 volt.

MINING MACHINES

Jeffrey, 35B and 4—28A, 250 V. 4—29B, 29C, 29CE with shearing head.
Revolving head for 29C.
1—35 BB AC 220 volt.
Goodman, 12A, 12AB, 12AA, 12G3A, 24B.
1—12G3 250 volt and 2—112 DA, 500 volt.
2—Permissible Type 12CA. 6—112AA,
2—124 E.J.
Motors for 212AA, both 250 and 500 volts.
Sullivan, CE7, CE9, CE10. CR10 Low Vein. CR5 for middle cutting.

SUBSTATIONS—275 volts, D. C.

2—200 KW **G.E.** Rotaries (600 volt).
2—150 KW **West.** Rotary.
1—200 KW 1—100 KW **Ridgway** M-G Sets.
2—100 KW **G.E.** Rotary.
1—200 KW **Westinghouse** M-G Set 900 RPM, 2300-275 volt.
1—100 KW **Westinghouse** M-G Set.

SPARE ARMATURES

Jeffrey MH 110, MH 78, MH 73, 29B, 35B and 28A. **Goodman** 34B, 30B, 30C, 12A, 12AB, 12AA, 33-1-4-T, 31-1-4-T. **General Electric** 801, 803, 819, 821, 825, 839. **Westinghouse** 904, 906, 102, 907, YR2, 115. Also 200 KW **Westinghouse Rotary Converter Armature,** 250 V Bracket Type, 150 KW G. E., HCC Bracket Type, and 150 KW G. E., TC Pedestal Type.

35BB **Sullivan** CE 6, CE 7, CE 9 and CE 10.

AERIAL TRAMWAYS • HOISTS • PUMPS • MOTORS • TRANSFORMERS • BOND WELDERS • RESISTANCE • COMPRESSORS • DUMPS • SPEED REDUCERS FIELD FRAMES • ARMATURES • GOODMAN HYDRAULIC SHOVELS • MOTOR STARTERS AND CONTROLLERS—AC & DC • DROP BAR SUPPORTS (Gooseneck), 29B and 29C • MINING MACHINE TRUCKS • SWITCHBOARDS • CIRCUIT BREAKERS—AC & DC • CONVEYOR HOISTS • COAL CRUSHERS (double roll) 12"x16", single roll 24"x36", 24"x24" • LATHES, SWITCHES • AUTOMATIC CIRCUIT BREAKERS 250 volt 600 amps to 2000 amps • MANUAL CIRCUIT BREAKERS 600 amps to 3000 amps • HOISTS, overhead, AC 3-60-440, 1 ton and 2 ton • 1 clam shell bucket 1¾ cubic yard • MINE CARS • 2 SULLIVAN BIT SHARPENERS • R. R. SWITCHES 85# to 100# GENERATORS DC 250-275 volt, 30 KW to 100 KW. 50 KW 125 volt direct connected to steam engine. Also SPARE MOTORS DC and AC for mining machines and locomotives.

GUYAN MACHINERY COMPANY, Logan, W. Va.

ROTARY CONVERTERS

500 KW AL-CH SYN 275 V. 6 Ph., 60 Cy., 1200 RPM, Pedestal Type, 2300/4000 V. Transformers.
300 KW AL-CH SYN 275 V. 6 Ph., 60 Cy., 1200 RPM, Pedestal Type, 2300/4000 V. Transformers.
300 KW G.E. SYN 575 V. HCC, 6 Ph., 60 Cy., 1200 RPM, form P, 2300/4000 V. Transformers.
150 KW WEST. SYN. 275 V. 6 Ph., 60 Cy., 1200 RPM, Bracket Type, 2300/4000 V. Transformers.

MOTOR GENERATORS

500 KW G.E. SYN. 600 V. 2200/4000 V., 3 Ph., 60 Cy., 720 RPM, Manual Switchgear.
300 KW G.E. SYN. 275 V., 2300/4000 V., 3 Ph., 60 Cy., 1200 RPM, Semi-Automatic Switchgear.
300 KW G.E. SYN. 600 V., 2300/4000 V. 3 Ph., 60 Cy., 1200 RPM, Semi-Automatic Switchgear.
300 KW WEST. SYN., 275 V., 2200/4000/6600 V., 3 Ph. 60 Cy., 900 RPM, Manual Switchgear.
150 KW WEST. SYN., 600 V., 2300/4000 V., 3 Ph., 60 Cy., 1200 RPM, Manual Switchgear.

LOCOMOTIVES

15-T WESTGHSE., 250 V., 908-C Mts., 36"-44" Ga.
15-T WESTGHSE., 500 V., 908-C Mts., 36"-44" Ga.
13-T WESTGHSE., 500 V., 908-C Mts., 36"-44" Ga.
13-T JEFFREY, 500 V., MH-110 Mts., 36"-44" Ga.
13-T G. ELEC., 250 V., HM-829 Mts., 36"-42" Ga.
10-T WESTGHSE., 500 V., 907-C Mts., 36"-44" Ga.
10-T WESTGHSE., 250 V., 907-C Mts., 36"-44" Ga.
8-T WESTGHSE., 500 V., 906-C Mts., 36"-48" Ga.
13-T GOODMAN, 500 V., 36-B Mts., 36"-42" Ga.
8-T WESTGHSE., 250 V., 906-C Mts., 36"-44" Ga.
8-T GEN. ELEC., 250 V., 839 Mts., 36"-48" Ga.

Each unit listed above is owned by us and is available now for immediate purchase.

WALLACE E. KIRK COMPANY
Incorporated
501 Grant Building Pittsburgh, Pa.

COAL CUTTING MACHINES

3—35B Jeffrey 250 V. shortwalls.
1—35BB Jeffrey A. C. shortwalls.
2—35B Jeffrey 500 V. shortwalls.
1—124EJ Goodman, 50 HP, 250 V. permissible track mounted slabbing machine.
1—12DA Goodman, 50 HP, 250 V. D.C.
2—12AA Goodman, same
1—12G3 Goodman, shortwall, 3/60/220 V., A.C.
1—12AB Goodman shortwall, 250 V. D.C.
1—36B Jeffrey, 250 V., 14" high.

ELECTRIC LOCOMOTIVES

1—13 Ton GE with HM-829 motors.
1—10 Ton GE steel frame, 250 V., HM—830-A motors.
1—10 Ton West. with 907-C motors, 250 V., 42" gauge, bar steel.
1—6 Ton West. bar steel frame, with 904-C 250 V. motors.
1—6 Ton Jeffrey, MH-88 motors, any gauge.
1—5 Ton G.E. ready to operate, 42" gauge.
2—5 Ton Goodman 250 V, 36" gauge.
1—4 Ton Jeffrey MH-96 motors.

MISCELLANEOUS

1—165 HP GE Syn. 2200 V., 900 RPM motor.
1—100 KW GE type TCC, Form P, Rotary Converter, 275 V. D. C. with 2300-4000 volt transformers.
1—907-C West. motor & axle caps.
1—100 Ton Wheel Press.

TIPPINS MACHNERY CO.
PITTSBURGH 13, PENNSYLVANIA

MINE HOISTS

1—Vulcan, Band Friction, will coil in excess 5000 ft. 1" rope. 200 H.P. 2200 Volt Motor and Control
1—Wellman, Keyed Drum, 60" Dia. will coil 4500 ft. 1" rope. 200 or 300 H P. Motor with Magnetic Control.
1—Vulcan, Shaft Hoist, 72" Dia. Suitable 300 ft. Shaft. Motor with control to suit requirements.
1—Nordberg, Shaft Hoist. 72" Dia. Suitable 200 ft. Shaft. 150 H.P. Motor with Control.
1—Vulcan, Cylindro-Conical, Shaft Hoist. Drum 7'-9' Dia. Suitable 350 ft. Shaft. 400 H.P. Motor with Control.

Other Hoists available to suit all mining conditions.

JONES MINING EQUIPMENT CO.
Empire Building, Pittsburgh 22, Pa.

AIR COMPRESSORS:

12—Belted 360, 676, 870, 1000, 1300 ft.
12—Diesel 105, 315, 520, 676 & 1000 ft.
6—Electric 1300, 1500, 2200, 5000 ft.

RUBBER CONVEYOR BELTS:

1000', 60". 600', 30". 300', 20". 1000' 42". 900', 48". 1450', 36". 1200', 24". 900', 18". 600', 16". 350', 14".

ELECTRIC LOCOMOTIVES:

15—3, 5, 8 ton Battery & Trolley.

DIESEL GENERATORS:

12—100, 150, 180 & 480 KW.

MINE LOADERS:

17—GD9, Eimco 21, Conway 20, 50, 60 & 75 and Sullivan HL3.

STEEL TANKS:

30—8000, 10,000 & 20,000 gallon capacity.

SHOVELS—DRAGLINES:

7—1 yd., 1½ and 2 yd. Gas & Diesels.

R. C. STANHOPE, INC.
60 E. 42nd Street New York 17, N. Y.

250 MINE CARS

Composite, electric welded rotary dump type. Toncan steel, white oak bottom. Timken roller bearings, square alloy steel axles, 14" wheels, 4 wheel brakes, Gauge 44". Overall length 131", body 110", width 68", Wheelbase 36". Height above rail 42". Capacity 120 cu. ft. level. Swivel type hitchings.

These cars in service now, are offered subject to release November 1st, located within 20 miles Pittsburgh.

JONES MINING EQUIPMENT CO.
Empire Building, Pittsburgh 22, Pa.

FOR SALE

1—Lorain 75-B, 1¼ yard Shovel.
1—3T Monaghan Electric 3 yard Walking Dragline.
1—3 yard, 1—2¾ yrd, 1—2 yard Dragline Buckets.

INDIAN HEAD COAL CO.
612 No. Michigan Ave., Chicago, 11, Ill.

NEW & REBUILT

Automatic Breakers—Rotary Converters
Motors & Control—Transformers
Fuse Cutouts, Etc.

R. H. BENNEY EQUIPMENT CO.
Norwood (12) Ohio
Better Known—Known To Be Better

NEW and REBUILT
STORAGE BATTERY

LOCOMOTIVES

1½ to 10 Ton 13" to 56" Track Gauge

GREENSBURG MACHINE CO.
Greensburg, Penna.

BONDED SCALES, VIBRATING SCREENS, CRUSHERS

15 ton, 22' x 9' Truck Scale	$ 440.00
20 ton, 24' x 10' Truck Scale	$ 575.00
20 ton, 34' x 10' Truck Scale	$ 815.00
26 ton, 24' x 10' Truck Stle	$ 642.00
33 ton, 34' x 10' Truck Sale	$1040.00
40 ton, 40' x 10' Truck Scale	$1565.00
3 ton Tipple Scale	$ 135.00
3' x 6' Single Deck Screen	$ 495.00
3' x 8' Double Deck Screen	$ 685.00
3' x 8' Single Deck Screen	$ 585.00
3' x 8' Three Deck Screen	$ 885.00
Double-Roll Coal Crusher	$ 345.00
Large Double Roll Crusher	$ 795.00
Portable Power Bag & Stacker	$ 600.00

We manufacture over 100 models of scales, vibratina screens, crushers, conveyor stackers. More than 1500 mines have our equipment. Immediate delivery. Write, phone or wire for catalog and prices.

BONDED SCALE COMPANY, MFRS.
2190 S. Third St., Columbus 7, Ohio

SPECIAL OFFERING

85

50-TON ALL STEEL SIDE DISCHARGE HOPPER CARS. 1831 cu. ft. CAPACITY. CAST STEEL SIDE FRAMES.

PROMPT DELIVERY

IRON & STEEL PRODUCTS, INC.
40 years' experience
13484 S. Brainard Ave., Chicago 33, Ill.
"ANYTHING containing IRON or STEEL"
ISP'S popular Scripto Pencil sent to all responders.

IRON and STEEL PIPE

New and Used

Large stocks, all sizes attractive prices

L. B. FOSTER COMPANY
P. O. Box 1647 Pittsburgh 30, Pa.

REBUILT MINING EQUIPMENT

DOUBLE DRUM HOIST
1—50 HP Lidgerwood Double Drum Hoist, drums 24" x 24", good for 5000# RP and 4000 ft. of ½" rope, motor driven.
MOTORS - GENERATORS - TRANSFORMERS

JOHN D. CRAWBUCK CO PGH. (12) PA.

NEW AND GUARANTEED
Used Steel Pipe and Boiler Tubes
Steel tanks—steel buildings
all sizes and kinds
Valves and fittings.
JOS. GREENSPON'S SON PIPE CORP.
Natl. Stock Yds., St. Clair Co., Ill.

FOR
IMMEDIATE DELIVERY
OF
RUBBER PRODUCTS

Conveyor Belting...Transmission Belting...Elevator Belting...Fire, Water, Air, Steam, Suction or Welding Hose, etc.

CALL, WIRE or WRITE
CARLYLE
THE RUBBER HEADQUARTERS

CARLYLE RUBBER PRODUCTS ARE NEW, GUARANTEED & LOW PRICED

CONVEYOR BELTING

ABRASIVE RESISTANT COVERS

Width	Ply	Top-Bottom	Covers
48"	8	1/8"	1/16"
42"	5	1/8"	1/16"
36"	6	1/8"	1/16"
30"	6	1/8"	1/16"
30"	5	1/8"	1/16"
24"	5	1/8"	1/32"
24"	4	1/8"	1/32"
20"	5	1/8"	1/32"
20"	4	1/8"	1/32"
18"	4	1/8"	1/32"
16"	4	1/8"	1/32"
14"	4	1/16"	1/32"
12"	4	1/16"	1/32"

Inquire For Prices - Mention Size and Lengths

TRANSMISSION BELTING

HEAVY-DUTY FRICTION SURFACE

Width	Ply	Width	Ply	Width	Ply
18"	6	10"	6	6"	5
16"	6	10"	5	5"	5
14"	6	8"	6	4"	5
12"	6	8"	5	4"	4
12"	5	6"	6	3"	4

Inquire For Prices - Mention Size and Lengths

ENDLESS "V" BELTS

"A" WIDTH All Sizes | "D" WIDTH All Sizes
"B" WIDTH All Sizes | "E" WIDTH All Sizes
"C" WIDTH All Sizes | Sold in Matched Sets

Inquire For Prices - Mention Size and Lengths

PROTECT THAT PLANT
FIRE HOSE

APPROVED SPECIFICATION HOSE
EACH LENGTH WITH COUPLINGS ATTACHED

Size	Length	Per Length
2½"	50 feet	$28.00
	25 "	16.00
2"	50 "	23.00
	25 "	13.00
1½"	50 "	20.00
	25 "	11.00

Specify Thread On Couplings

SPECIAL OFFER . . . HEAVY DUTY
RUBBER HOSE

WATER HOSE
Each Length with Couplings Attached

I.D. Size	Length	per Length
¾"	25 feet	$4.25
1"	50 "	8.00
	25 "	6.25
1¼"	50 "	12.00
	25 "	7.50
	35 "	10.50
	40 "	12.00
	50 "	15.00
1½"	25 "	10.00
	35 "	14.00
	50 "	20.00

AIR HOSE

I.D. Size	Length	per Length	Couplings
½"	25 feet	$5.00	$1.50 Pair
	50 "	10.00	1.50 "
¾"	25 "	6.25	2.50 "
	50 "	12.50	2.50 "
1"	25 "	10.00	3.50 "
	50 "	20.00	3.50 "

LARGER SIZES ALSO AVAILABLE
All Prices—Net—F.O.B. New York

CARLYLE RUBBER CO., INC.
62-66 PARK PLACE NEW YORK, N. Y.

PIPE—MACHINERY—GAS ENGINES
AIR COMPRESSORS—DIESELS—PUMPS
Some Steam Engines and Boilers available only slightly above the metal price
BRADFORD SUPPLY COMPANY
WAYNE, WOOD COUNTY, OHIO Near Toledo

PIPE New & Reconditioned
ALL SIZES for ALL PURPOSES
Cut and Threaded to Your Specifications
VALVES AND FITTINGS
UNITED PIPE & SUPPLY CO. Department 110 NORRISTOWN, PA.

BARGAINS FOR IMMEDIATE DELIVERY!

Frank J. Wolfe

LOCOMOTIVES

2—15-ton Goodman, type 136-A-O-4-C, 250 volt.

4—13-ton Jeffrey, type MH-110, 250 volt.

8—8-ton General Electric, type HM-822, 250 volt.

9—6-ton General Electric, type HM-801 and HM-823, 250 volt.

ALL COMPLETELY REBUILT AND GUARANTEED

ROTARY CONVERTERS

2—500 KW Allis-Chalmers, synchronous type, 250/275 volt DC, 2300 volt AC, complete with transformers, switchboards and all appurtenances.

LOADING MACHINES

1—Myers-Whaley #3 Automat. Just taken out of service. Several 7 and 5-BU Joy Loading Machines.

Several 3, 4 and 5-track steel tipples and electric hoists from 200 to 1500 H.P.

We specialize in buying complete mines that are going ous of business or from receivers in bankruptcy, administrators of estates, etc.

COAL MINE EQUIPMENT SALES COMPANY

306-7 Beasley Building — L. D. Phone-34 — Terre Haute, Indiana

---

Coal Cutting Machines

11—CE-7 Sullivan Shortwall AC Coal Cutters, 30 H.P. Motors, 7½' Cutter Bars, Tip-Turn Trucks and approx. $5000. worth of new parts. We can make attractive prices on these machines. All in guaranteed condition.

Write for Stock List

FLORENCE MACHINERY & SUPPLY CO.

904 Equitable Building, Denver 2, Colo.

Yards and Warehouses at Denver and Florence

1—120-B Bucyrus-Erie Electric Dragline. 100' boom, 4 yard dragline bucket. Completely rebuilt.

1—Model 1001 Lima Dragline. Waukesha-Hesselman oil engine. 80' boom, 2½ yard bucket. Completely rebuilt.

2—Model 802 Lima Dragline. 70' boom, 2 yard heavy dragline bucket. Waukesha-Hesselman oil engine.

1—2 yard Shovel Front for Model 802 Lima.

1—K-480 Link-Belt Dragline. Waukesha-Hesselman oil engine. 75' boom, 2 yard heavy duty Page bucket.

1—75A Lorain 1¼ yard Lorain Shovel. Excellent condition.

All machines
Central Pennsylvania location.

Frank Swabb Equipment Company

313 Hazleton National Bank Bldg.

Hazleton, Pa. — Telephone 4910J

FOR SALE

Two used 463 H.P. Class Q, No. 30, Special.

B&W STIRLING BOILERS

Working Pressure 150 pounds per square inch when new. Installed in 1914. Boilers complete with stacks, piping valves, blowers and accessories. If interested address your inquiry to

THE HUDSON COAL COMPANY

C. W. Carpenter, Purchasing Agent

424 Wyoming Ave. — Scranton, Pa.

UNIVERSAL TOOLS! NATIONALLY ADVERTISED BRANDS AND PRICES

If it's Tools—We have it, Can get it, or it isn't made! *Price List & Order Blank Free!!*

UNIVERSAL TOOL COMPANY

O. B. Demattels, President

1527 Grand P. — Kansas City, Missouri

Immediate Shipment: Overnight by Air: To Anywhere—USA.

FOR SALE

COMPLETE POWER PLANT

2—Stoker Feed Boilers
1—419 H.P.—150# Pressure
1—350 H.P.—250# Pressure

1—Westinghouse Steam Turbine—625 KVA 3600 R.P.M.—2300 Volts

1—General Electric Steam Turbine—500 KW—3600 R.P.M.—2300 Volts
Condensers - Panel Board

All Auxiliary Equipment

Write F. A. HUNTER, *Purchasing Agent*

Southern Wyoming Utilities Co.

404 N Street, Rock Springs, Wyoming

FOR SALE—

SHASTA DAM SAND AND GRAVEL PLANT EQUIPMENT

Including—
GOODYEAR 9-MILE-HAUL 36" SPECIAL CONVEYOR BELTING
32,000' of Belt Remaining With Idlers, Pulleys, and Drives

ALSO—
Electric Motors, Line Equipment, Transformers, and Supplies
Pendulum Boom Belt Conveyors, 100' and 200'
Merrick Feedoweights and Weightometers
Dorr Hydroseparator, 20' x 4'
Marcy Rod Mill, 8' x 12'
Vibrating Screens
Dorr Rake and Bowl Classifiers
Extra-heavy Gravel Washer, Trommel type
Pumps: Centrifugal, Deep-well, Steam, Dredge
Auxiliary Equipment: Chain Hoists, Winches, Welding Machines, etc.

Subject to Prior Sale

Write, Wire, Telephone Redding 1440

Columbia Construction Company, Inc.

Box 579 — Redding, California

FOR SALE

1—10,000 gallon Wendnagel wooden water storage tank, erected on 60' steel tower, together with pump and 2 HP AC motor, 13' in diameter with 12' length of staves. Offered where and as is, subject to prior sale.

500—metal miners wash-house clothes Hanger Baskets, each complete with chain and two pulleys.

CITIZEN'S COAL MINING CO.

507 Central Bank Building

Peoria, Illinois

Phone - 9112

FOR SALE

1 500 HP GENERAL ELECTRIC HOIST MOTOR

1 General Electric Induction Motor #4223484, Type MT412-16-500-450, Form A, 60 Cycle, 123 Ampere, 500 HP, 2200 V Secondary volt 340, Secondary ampere 430, Speed full load 435, Continuous 50° C. Rise together with primary and secondary reversing switchgear, magnetic control.

William P. Sullivan
Industrial Equipment
Connellsville, Pa.

Bucyrus-Erie 50B steam 2-1/3 yd. shovel, #10635, 26' boom, 17' sticks, manganese rock dipper, steel cab; 100% rebuilt; guaranteed.
Vulcan 18-ton steam S/T locomotive, 42" gauge.
Porter, Vulcan 36" ga. steam locomotives, 18 & 17 tons; Milwaukee 8-ton gas (rebuilt).
Baldwin and Lima-Shay steam locomotives, 58, 56, 50, 42 and 40 tons, std. gauge (5).
Shovels, Draglines, Trailers, Cat. Wagons.

H. Y. SMITH CO.

828 N. Broadway — Milwaukee 2, Wis.

FOR SALE

One Goodman Standard Shortwall

CUTTING MACHINE

Completely overhauled with new feed drum and shaft, A.C. 220 V., 60 cycle, 3 phase for 36" gage track. Has about 200 ft. cable and 50 ft. hand cable with reel trucks. Machine guaranteed to be in A-1 condition. Stator coils, brand new, dipped and baked.

Wanted to Swap: Two Universal Goodman, tiptable cutting machine trucks (42" gage) in good condition, for two Universal Goodman low-vein, Stub axle (36" gage) trucks. The low-vein trucks must be in good condition, and we will trade even. Will buy out-right if no trade is wanted.

RICHARDSON COAL CO.

Linton, Ind.

Reconditioned Wire Rope for

DRAGLINES

Sizes ⅝" to 1¼" IWRC
Lengths up to 1600'

CROWN CABLE CO.

54 E 4th St. — New York 3, N. Y.

Buying

Good USED Equipment

is frequently the difference between having needed equipment or doing without it.

REBUILT EQUIPMENT—READY TO SHIP

MOTOR GENERATOR SET

1—200 kw. West. 600 v. DC 900 rpm Gen. direct. driven through common shaft by 1—290 HP 440 v. 3 ph. 60 cy. West. Syn. Motor.

ROTARY CONVERTERS

3—150 kw. West. 3 ph. 60 cy. 275 v. 1200 rpm. Rotary Converters comp. with transformers, switchboard.
3—300 kw. West. 3 ph. 60 cy. 600 v. 1200 rpm. Rotary Converters comp. with transformers, switchboard.

MINING MACHINES—250 v. DC

1—CE-7 Sullivan 36" ga.
1—Armature for CE-7 Sullivan 250 v. DC.

MINE LOCOMOTIVES

1—5 ton Ironton Storage Battery Locomotive.
3—5 ton Goodman 30 B 250 v. 36" ga.
1—10 ton Goodman Haulage or Gathering Locomotive. 250 v. 42" ga. Inside wheels.
1—13 ton Westinghouse 42" ga. 250 v. Locomotive, two motor type: single end control.

PUMPS

1—Amer. Piston Pump—5½x4½"—size 8x12.
1—48 GPM 161' hd. Roper 3" suc. 3" dis.
1—90 GPM 225 ft. head, 600 rpm. 2x2" Blackmer
1—135 GPM 18' hd. Le Courtenay Cent. Pump. 3 HP
2—135 GPM 40' hd. Le Courtenay Cent. Pumps.
1—200 GPM 30' hd. Le Courtenay Centq Pump. 3 HP
2—200 GPM 80' hd. Le Courtenay Cent, Pumps.
1—220 GPM 225 ft. head, 600 rpm. 3½"x3" Blackmer
1—230 GPM Amer. Steam Pump Co. 115' hd. 5½" intake x 4½" discharge, 45 rpm.
1—300 GPM 10' hd. Chicago 3" Vert. Sump Pump.

SLIPRING MOTORS—3 ph. 60 cy.

HP	Make	Type	Volts	RPM
700	G.E.	MT-432	2200	393
300	G.E.	I	440	900
260	Burke	EMV-65	440	600
260	Burke	EMV-65	2200	600
100	Burke	EMV-20	220	600 (2 ph.)
50	Chand.		220/440	1800
30	West.	CW	220	900
15	West.	CW	220	870

230 V. DC MOTORS

HP	Make	RPM	Type
5	Cr. Wh.	960	CM
5	Cr. Wh.	980	CM
5	Imperial	540	SK
5	Westg	850	
10	Cr. Wh.	825	CM
10	Cr. Wh.	675	CCM
20	Lincoln	720	
25	Lincoln	900	
30	Lincoln	1200	
80	West.	490	76A
85	G.E.	900	DLC
100	West.	300	SK
100	West.	175/300/700	SK

TRANSFORMERS

No.	Kva.	Pri.	Sec.	Make
9	5	2200	110/220	G.E.&West.
100	7½	2200	110/220	G.E.&West.
16	10	2200	110/220	G.E.&West.
21	15	2200/1100	440/220/110	West.
2	15	2300	230/460	American
3	15	2200	110/220	Packard
3	15	2200	110/220	Cr. Wh.
2	20	1150/2300	115/230	Maloney
2	20	2300	230/460	American
1	20	2300	110/230	West.
2	20	2200/1100	440/220/110	West.
2	25	2300	230/460	American
2	25	2300	110/220	West.
9	37½	2400	240/480	G.E.
3	40	2200/1100	220/110	West.
1	40	1100/220	110/220	Pittsburgh
1	40	2300/1150	115/230	Maloney
2	50	2200	110/220	Packard
1	50	6600	550/440	Allis Chal.
1	50	2200/1100	220/110	West.
2	50	2200/1100	220/110	Maloney
3	75	2400	240/480	G.E.
1	100	2300	230/115	Standard
1	112.5	2400	240/480	G.E.
3	125	2200	220/440	G.E.
2	150	2200/2300/2400	220/230/240	G.E.
3	250	6600/5940	2300	West.

DIESEL ENGINE GENERATOR SET

1—40 kw. 250 v. DC Gen. belt driven by 65 HP Primm Diesel Hor. Engine.

DUQUESNE ELECTRIC & MFG. CO., PITTSBURGH (6), PA.

MINING MACHINES

AC & DC

REBUILT & GUARANTEED FOR IMMEDIATE SHIPMENT

COAL CRUSHERS

Jeffrey, 30x30 single roll and 24x30 double roll.

Electric Coal Drills, Mine Fans, Tipple Scales, etc.

2—Ironton 5-ton Storage Battery Locomotives

½ yard GAS SHOVEL, rebuilt

PUMPS 4" and 6", centrifugal, gas driven.

Equipment of all kinds

Buy, Sell or Exchange

THE INDUSTRIAL EQUIPMENT CORP.

705 First National Bank Bldg.
Pittsburgh 22, Pa.

Warehouse: Carnegie, Pa.

★ **LOCOMOTIVES—ALL 250 VOLT**

1—4-Ton Jeffrey, type MH-96, 42" gage
1—4-Ton Westinghouse, type 902, 42" gage
1—4-Ton Goodman, type 42-I-4-T, 42" gage
1—4-Ton G.E. type HM-825, 36" gage
1—5-Ton Goodman, type 2600-R, 44" gage
1—8-Ton Goodman, type 32-0-4-T, 42" gage
1—8-Ton Westinghouse, type 65, 44" gage
1—10-Ton Jeffrey, MH-110, 42" gage

CUTTING MACHINES

1—29-C Jeffrey Arcwall, 250 volt, 42" gage
2—35-L Jeffrey Shortwalls, 220-440 volt A.C.
2—7-AU Sullivan, 250 volt, 36 to 48" gage
1—7-AU Sullivan, 500 volt, 36 to 48" gage

SUBSTATIONS

1—75-KW. G.E. M-G Set complete, 275 volt Generator, 2300/4000 volt induction motor, complete with switchboard.
2—150-KW. Ridgeway Motor-Generator Sets complete, 275 volt generators, 2300 volt Sync. motors, complete with switchboards.
1—300-KW. G.E. Rotary Converter, type TC-8, form P. 900 RPM, complete with transformers and switchboard.

MISCELLANEOUS

1—Sullivan bit sharpening machine complete with heating furnace
1—18 x 18" Jeffrey single roll coal crusher
1—5 x 8' Fairmont vibrating screen
1—No. 3 Cincinnati Milling machine complete with Lima drive

Armatures for cutting machines and Locomotives, motors, starters, transformers and many other items in stock.

We Solicit Your Inquiries.

ALL-STATE EQUIPMENT CO.

LOGAN, W. VA. *Phone 884* ★

48 & 60 INCH CONVEYOR BELTS

850 Ft. 48 In. 8 Ply.
2175 Ft. 60 In. 10 Ply.
CONDITION LIKE NEW

R. C. STANHOPE, INC.

60 East 42nd St. New York 17, N. Y.

RAILS — CARS

All sections of rails and good serviceable second hand cars, all gauges, also spikes, bolts, frogs, switches and ties.

M. K. FRANK

480 Lexington Ave. New York, N. Y.
810 Park Bldg., Fifth Avenue Pittsburgh, 22, Pa.
Reno, Nevada Carnegie, Pa.

RAILS NEW AND RELAYING

TRACK ACCESSORIES

from 5 *Warehouses*

- PROMPT SHIPMENTS
- FABRICATING FACILITIES
- TRACKAGE SPECIALISTS

EVERYTHING FROM ONE SOURCE

L. B. FOSTER COMPANY
PITTSBURGH • CHICAGO • NEW YORK

TOP CUTTING MACHINE

1—Goodman type 724 E J 250 volt. 9 ft. Cutter Bar with two chains, adjustable from 35" to 77" cut.

JONES MINING EQUIPMENT CO.

Empire Bldg. Pittsburgh 22, Pa.

RELAYING RAILS

and accessories

Immediate Shipment

MIDWEST STEEL CORPORATION
CHARLESTON WEST VIRGINIA

150 TON—Caldwell Hydraulic Wheel Press —Direct Motor Driven by 250 Volt D.C. Motor—38" between Tie Bars—

In A#1 Condition—Immediate Shipment

ARTHUR S. PARTRIDGE

415 Pine St. St. Louis 2, Mo.

FOR SALE:

Going Truck Mine, 55" average height coal, clean coal, good top, hand loaders, coal is trucked to railroad for shipment, 4 to 6 railroad cars per day. 100 HP Diesel power plant, 250 Volts. Goodman mining machine, Jeffrey locomotive, hoist, electric drill, 30 mine cars.

GUYAN MACHINERY CO.

LOGAN, W. VA.

FOR SALE

FREQUENCY CHANGER

1—6875 KVA WEMCO 13,200/4150 V. 25/62½ Cy. 375 RPM

MOTOR GENERATOR SET

1—1000 KW WEMCO 3/60/6600 or 4400 V. to 230/275 V. DC, 295 RPM

ROTARY CONVERTER

1—500 KW WEMCO 3/25/13,200 V. to 250 or 500 V. D.C. 500 RPM

Consolidated Gas Electric Light & Power Co. of Baltimore

Purchasing Dept. 531 E. Madison St. Baltimore 3, Md.

COAL AGE ADVERTISERS IN THIS ISSUE

An asterisk preceding manufacturer's name indicates detailed information may be found in the 1944-1945 *MINING CATALOGS*

Acker Drill Co. 150
*Air Reduction Co. 173
*Allen-Sherman-Hoff Co. 125
*Allis-Chalmers Mfg. Co. 66
*American Brattice Clotn Corp. 194
*American Cable Div. of American Chain and Cable Co. ..... Third Cover
American Coal Sales Ass'n. 71
American Crucible Products 186
*American Cyanamid & Chemical Corp. 57
*American Mine Door Co. 230
*American Pulverizer Co. 64
*American Steel & Wire Co. 16, 17, 28
Ames Baldwin Wyoming Co. 187
Anaconda Wire & Cable Co. 141
Arkansas Fuel Oil Co. 163
Atlas Powder Co. 26

Bemis Bros. Bag Co. 180
*Bethlehem Steel Co. 6
Bituminous Coal Institute 199
Boston Woven Hose & Rubber Co. 65
*Bowdil Co. 153
Breuer Electric Mfg. Co. 191
Bristol Co. 191
*Brown-Fayro Co. 217
*Buffalo Forge Co. 202

Cardox Corp. 67
Carver Pump Co. 164
Cement Gun Co. 180
*Central Mine Equipment Co. 7
Centrifugal & Mechanical Industries, Inc. 192
Chicago Perforating Co. 232
*Chicago Pneumatic Tool Co. 48
Christie Co., L. R. 231
*Cincinnati Electrical Tool Co. 232
*Cincinnati Mine Machinery Co. 138
Cities Service Oil Co. 163
Coast Metals, Inc. 183
Coffing Hoist Co. 170
Collyer Insulated Wire Co. 190
*Construction Machinery Co. 224
*Continental Gin Co. 225
Crane Co. 18
Crocker Wheeler Division 195
Cummins Engine Co. 119

*Deister Concentrator Co. 149
*Deister Machine Co. 186
*Differential Steel Car Co. 76
*Dings Magnetic Mfg Co. 194
Disston and Sons Inc., Henry 207
Dow Corning Corp. 169
Duff-Norton Mfg. Co. 156
*duPont de Nemours and Co., E. I. Grasselli Chemicals Dept. 159

*Edison Storage Battery Div. Thomas A. Edison, Inc. 36
Elastic Stop Nut Corp. 147
*Electric Storage Battery Co. 115
*Ensign-Bickford Co. 80
Euclid Road Machinery Co. 218

*Fairmont Machinery Co. 171
Fawick Airflex Co. 69
Firestone Tire & Rubber Co. 49
Flexible Steel Lacing Co. 227
*Flocker & Co., John 54

Gar Wood Industries, Inc. 133
Gates Rubber Co. 214
*Gardner Denver Co. 206
General Cable Corp. 10, 11
General Electric Co. 30, 31, 123
General Tire & Rubber Co. 137
*Goodman Mfg. Co. 8, 9
Goodrich Co., B. F. 1
Goodyear Tire & Rubber Co. 32, 33
*Gorman-Rupp Co. 158
Gould Storage Battery Co. 148
*Goyne Steam Pump Co. 231
Greensburg Machine Co. 180
Gulf Oil Corp. 29
Gulf Refining Corp. 29
Guyan Machinery Co. 184, 194

Hammond Co., J. V. 229
Harnischfeger Corp. 60
Hartwell & Son, Inc., H. N. 208
*Hazard Insulated Wire Works 55
*Hendrick Mfg. Co. 231
Hercules Powder Co. 177
Hobart Bros. Co. 231
Hodgman Rubber Co. 183
Hulburt Oil & Grease Co. 2, 3

Imperial Cantrell Mfg. Co. 20
Independent Pneumatic Tool Co. 44
*Indiana Foundry Co. 227
International Harvester Co. 145
I.T.E. Circuit Breaker Co. 205

*Jeffrey Mfg. Co. Insert between pp. 20–25, 143
*Jenkins Bros. 209
*Jones & Laughlin Steel Corp. 179
*Joy Mfg. Co. 78, 79

Kennametal, Inc. 203
King Powder Co. 193
Koehler Mfg. Co. 61
Koehring Co. 41

*La-Del Conveyor and Mfg. Co. 165
*Laughlin Co., Thomas 189
Lee-Norse Co. 176
*Leschen & Sons Rope Co., A. 182
*Link-Belt Co. ..... Fourth Cover
Lubriplate Div. Fiske Bros. Refining Co. . 152

Macmillan Petroleum Corp. 198
Mack Trucks, Inc. 221
Macwhyte Co. 220
Marion Steam Shovel Co. 52
*Marlo Co. 192
Mayfair Hotel 191
McGraw-Hill Book Co. 229
*McLanahan & Stone Corp. 232
*McNally-Pittsburg Mfg. Co. Insert between pp. 41–44
*Merrick Scale Co. 176
*Mine Safety Appliances Co. 188
*Mines Equipment Co. 226
*Mir-O-Col Alloy Co. 224
Morrow Mfg. Co. 51
Mosebach Elec. & Supply Co. 168
*Mott Core Drilling Co. 189
*Myers-Whaley Co. 73

*National Malleable & Steel Castings Co. . 150
*Naylor Pipe Co. 166
New Departure Div. General Motors Corp. 117
*Norma-Hoffmann Bearings Corp. 211

Oliver Corp. 185
Ohio Brass Co. 37, 39
Owens-Corning Fiberglas Corp. 70

Page Engrg. Co. 216
Paris Mfg. Co. 168
*Pennsylvania Crusher Co. 227
Pettibone Mulliken Corp. 127
*Philco Storage Battery Div. 4
*Pittsburgh Knife & Forge Co. 189
Pomona Pump Div. Fairbanks Morse Co. 175
Post-Glover Electric Co. 56
*Princeton Foundry & Supply Co. 184
Provident Life & Accident Insurance Co. . 162

Reliance Electric Co. 205
Republic Rubber Div. 219
Robins Conveyors, Inc. 45
Rochester Ropes, Inc. 77
*Rockbestos Products Corp. 212
*Roebling's Sons Co., John A. 19, 154
Rome Cable Co. 40
*Ruberoid Co. 226

SKF Industries, Inc. 68
Salem Tool Co. 151
*Sanford Day Iron Works, Inc. 74, 75
Schaffer Poidometer Co. 192
Schramm, Inc. 50
Searchlight Section 233–239
Sheppard Co., R. H. 201
*Simplex Wire & Cable Co. 72
Socony-Vacuum Oil Co. 167
*Speer Carbon Co. 226
Standard Oil Co. of Indiana 131
Star Electric Motor Co. 200
Stearns Magnetic Mfg. Co. 160
*Stephens-Adamson Mfg. Co. 62
Stoody Co. 215
*Sullivan Mchy. Co. 46, 47
Sun Oil Co. ..... Second Cover, 121
Syntron Co. 224

Templeton Kenly Co. 223
Texas Co. 12, 13
Thermoid Co. 181
Tide Water Associated Oil Co. 34, 35
*Timken Roller Bearing Co. 129

Unit Crane & Shovel Corp. 229
United Engineers & Constructors, Inc. 197
United Iron Works 172
United States Rubber Co. 53, 157
*Upson-Walton Co. 155
*U. S. Steel Subsidiaries 16, 17, 28

Viloco Railway Equipment Co. 225
*Vulcan Iron Works Wilkes-Barre) 27
Vulcan Iron Works Co. (Denver) 230

*Walter Motor Truck Co. 63
Walworth Co. 38
Warren Steam Pump Co. 210
Ward LaFrance Truck Div. 25
*Weir-Kilby Corp. 172
*West Virginia Steel & Mfg. Co. 170
*Western Machinery Co. 213
*Westinghouse Electric Corp. 58, 59, 135
Whitney Chain & Mfg. Co. 222
*Wickwire Spencer Steel Co. 161
*Willson Products, Inc. 174
Wyandotte Chemicals Corp. 151

■

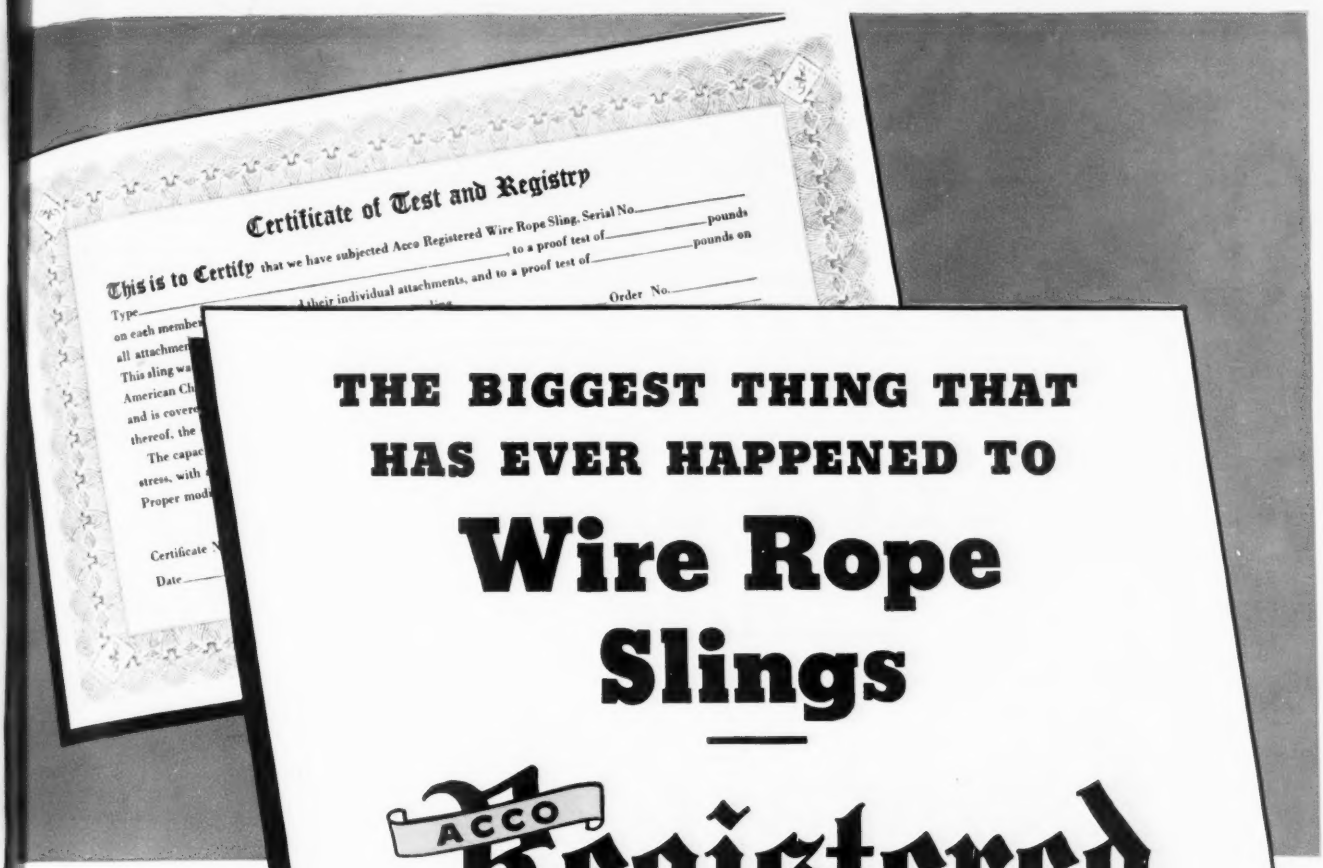
PROFESSIONAL SERVICES 196

■

SEARCHLIGHT SECTION

Classified Advertising

EMPLOYMENT 233
BUSINESS OPPORTUNITIES 233
WANTED TO PURCHASE 233
USED AND SURPPLUS EQUIPMENT 233–239
All State Equipment Co., Inc. 239
Benney Equipment Co., R. H. 236
Bonded Scale Co. 237
Bradford Supply Co., Inc. 237
Carlyle Rubber Co., Inc. 237
Cincinnati Machinery & Supply Co. 234
Citizens Coal Mining Co. 238
Coal Mine Equipment Sales Co. 238
Columbia Const. Co., Inc. 238
Consolidated Gas Elect. Lt. & Pr. Co. of Baltimore 239
Crawbuck Co., John D. 237
Crown Cable Co. 238
Duquesne Electric Mfg. Co. 239
Economy Co., Inc. 235
Electric Equipment Co. 236
Electric Service Co., Inc. 234
Florence Machy. & Supply Co. 238
Foster Co., L. B. 237, 239
Frank, M. K. 239
Gavenda Bros. 234
Greensburg Machine Co. 236
Greenspon's Son Pipe Corp., Jos. 237
Guyan Machinery Co. 236, 239
Hudson Coal Co. 238
Hyman-Michaels Co. 233
Indian Head Coal Co. 236
Industrial Equipment Co. 239
Iron & Steel Products, Inc. 237
Jay, Paul 233
Jones Mining Equipment Co. 236, 239
Kirk Co., Inc., Wallace E. 236
Midwest Steel Corp. 239
Moorhead Reitmeyer Co. 234
Partridge, Arthur S. 239
Richardson Coal Co. 238
Smith Co., H. Y. 238
Southern Wyoming Utilities Co. 238
Stanhope, Inc., R. C. 236, 239
Sullivan, William P. 238
Swabb Equipment Co., Frank 238
Tippins Machinery Co. 236
United Pipe and Supply Co. 237
Universal Tool Co. 238



THE BIGGEST THING THAT HAS EVER HAPPENED TO Wire Rope Slings

ACCO Registered by AMERICAN CABLE

● Now you can buy a wire rope sling that has been proof-tested and registered for known strength and safety. Never before has it been possible to do this.

American Cable proof-test every Registered sling to twice its safe working load. Then, as proof of perfection, you may have a Certificate of Test and Registry which will show the actual proof-test load and known strength furnished. Every sling, so registered, is identified by a metal registry tag, stating maximum safe load, date of testing, and registration number. All American Cable **ACCO-Registered Slings** are made only of TRU•LAY Preformed Wire Rope of Improved Plow Steel.

ACCO "Registered" Service helps you select the right wire rope sling for your particular job—then registers and identifies its predetermined strength.

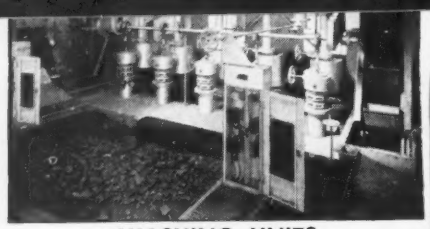
ACCO

Wilkes-Barre, Pa., Atlanta, Chicago, Denver, Detroit, Houston, Los Angeles, New York, Philadelphia, Pittsburgh, Portland, San Francisco, Tacoma, Bridgeport, Conn.

AMERICAN CABLE DIVISION
AMERICAN CHAIN & CABLE

TRADE MARK

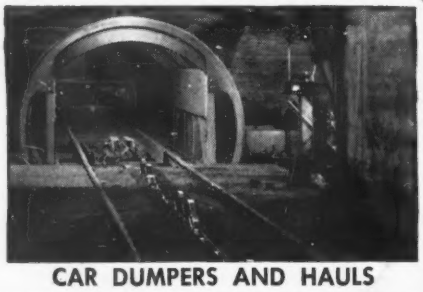
In Business for Your Safety



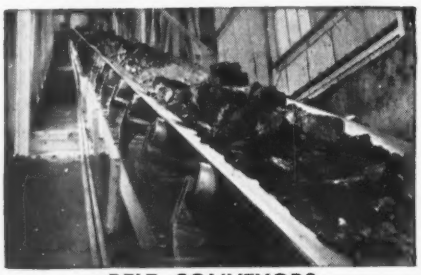
WASHING UNITS

SCREENS—ALL TYPES

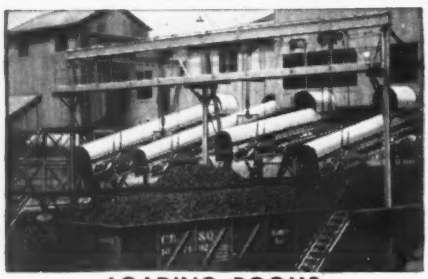
PICKING TABLES



CAR DUMPERS AND HAULS



BELT CONVEYORS



LOADING BOOMS

AS SPECIALISTS in the design, manufacture and application of conveying, cleaning, crushing, sizing, drying, and blending equipment and power transmission machinery, Link-Belt engineers have acquired and learned how to apply an extensive knowledge and experience, effectively, to the solution of materials handling, preparation and power transmitting problems of all kinds. While we have designed and built many of the country's largest coal preparation plants, as well as metallic and non-metallic ore handling systems, we have also designed hundreds of the smaller ones and revamped many others by the installation of individual units or the modification of existing equipment.

ENGINEERING SERVICE

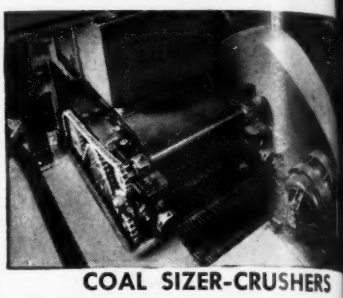
Submit your problems to Link-Belt. Our experienced engineers will analyze your requirements and make impartial, constructive recommendations. Write today!

LINK-BELT COMPANY

Chicago 9, Philadelphia 40, Pittsburgh 19, Wilkes-Barre, Huntington, W. Va., Denver 2, Kansas City 6, Mo., Cleveland 13, Indianapolis 6, Detroit 4, St. Louis 1, Seattle 4, Toronto 8.

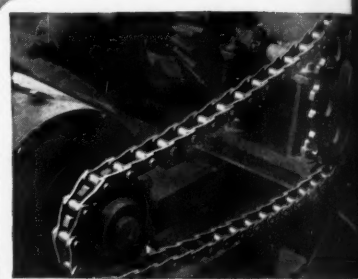
10,103

HEAT DRYERS

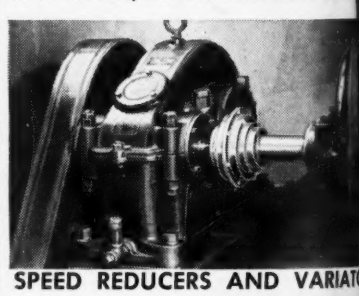


COAL SIZER-CRUSHERS

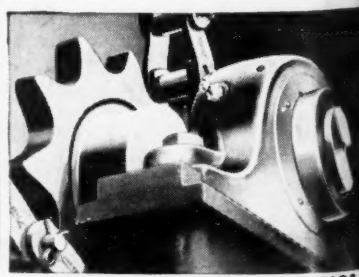
CONVEYORS—ALL TYPES



MALLEABLE, PROMAL & STEEL CHA



SPEED REDUCERS AND VARIATO



BALL & ROLLER BEARINGS

COAL PREPARATION AND HANDLING EQUIPMENT

Engineered, Built and Backed by LINK-BELT

THE SYMBOL OF QUALITY · LINK-BELT COMPANY ·